

Digitized by the Internet Archive
in 2022 with funding from
University of Toronto

<https://archive.org/details/31761115483935>

CA2 ON
NR
-1987 C42

Class Environmental Assessment for Timber Management on Crown Lands in Ontario

December, 1985

Amended June, 1987



Ontario

**Ministry of
Natural
Resources**

**Hon. Vincent G. Kerrio
Minister**

**Mary Mogford
Deputy Minister**



Ministry of
Natural
Resources

Minister

Government
Publications
Whitney Block
Queen's Park
Toronto Ontario
M7A 1W3
416/965-1301

(6)

CA 20N
NR
-1987
C42

July 6, 1987

The Honourable Jim Bradley
Minister of the Environment
15th Floor, 135 St. Clair Ave. W.
Toronto, Ontario
M4V 1P5

Dear Mr. Bradley:

On December 23, 1985, I submitted to you the Class Environmental Assessment for Timber Management on Crown Lands in Ontario. Since that time, this environmental assessment has been undergoing the process of government review. I am now submitting to you an amended version of this environmental assessment, which contains revisions of many components of the original document. The submission of amendments prior to finalization of the government review has been endorsed by your Environmental Assessment Branch, and is in accordance with Section 7 (3) of the Environmental Assessment Act.

The amendments have been made for four reasons:

- i. Many amendments are in response to concerns expressed by government reviewers;
- ii. Amendments to the planning process are based on the experience we have gained in applying this process over the past 18 months;
- iii. Amendments have been made to provide a better explanation of parts of the document; and
- iv. Certain amendments are made to correct errata, or bring information up-to-date.

The entire document has been reprinted as a matter of convenience, since amendments have occurred on more than half the pages of the original document. For ease of reference, all amendments are typed in an italic script. Where the only change is a deletion, this is specifically noted in the text.

Attached to this letter is a general outline of the changes that have been made to the document, to assist in your appreciation of both the type and extent of the amendments we have made.

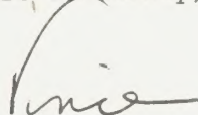
My staff will forward copies of these amendments to the Environmental Assessment Branch directly. We understand that a short period of additional government review will be required before your staff are able to write the government review report.



It is my sincere hope that the amendments we have made to this document will satisfy many of the concerns expressed to date. This will lead to fewer concerns requiring resolution before the Environmental Assessment Board, and a less protracted hearing. I look forward to the presentation of this environmental assessment before the board as soon as possible, and I am advised that we should expect to do so early in 1988.

If my staff can be of any assistance in explaining the contents of this document, please do not hesitate to ask.

Yours sincerely,

A handwritten signature in dark ink, appearing to read 'Vincent', with a long horizontal stroke extending to the right.

Vincent G. Kerrio
Minister

Outline of Amendments to the
Class EA for Timber Management

June, 1987

Part One: The Undertaking

Chapter 1. Historical Background

Section 1.2 Legislation and Policy

- A new section has been added, dealing with:
 - Crown Timber Act
 - Constitution Act & Indian rights

Chapter 3. Description of the Undertaking

Section 3.2 Area of the Undertaking

- This is a new section
- A new map of Ontario has been added
(perimeter of the undertaking is shown)

Chapter 5. A Class EA Approach

Section 5.1 Justification

- There is additional discussion to explain that the planning process ensures adequate environmental protection

Chapter 9. Alternative Methods

Section 9.1 General

- A new sub-section (9.1.1) has been added, "Use of Pesticides"
- There is re-wording and correction throughout entire chapter

Chapter 10. Description of Environment Affected

- There is a restructured discussion of the description of the environment at the "management unit" level

Chapter 11. Potential Environmental Effects

- There is re-wording and correction throughout the entire chapter

Part Two:

The Timber Management Planning Process

Chapter 1. Introduction

- This chapter is substantially re-written, with three new sections:

Section 1.2 Sustained Yield Management
Section 1.3 Forest Production Policy
Section 1.4 Integrated Resource Management Policy

Chapter 2. The Timber Management Planning Process

Section 2.1.2 The TMP Process-Plan Production

- This chapter is completely re-written, with the planning process now described as a four-step process. These steps are:
 1. Assembly and Analysis of Background Information
 2. Determination of Management Direction
 3. Identification of Potential Areas of Operations (20 years)
 4. Determination of Operations (5 years)

2.1.3 Public Consultation & Plan Review and Approval Process

- There is re-wording and corrections throughout this section
- There is a (new) commitment to provide copies of draft & MNR approved plans to MOE's Environmental Assessment Branch

2.1.4 Documentation

- There is additional discussion of the documentation requirements for a Timber Management Plan (i.e., text, tables and maps)

2.1.5 Plan Renewal and Amendment

- A new plan amendment procedure is included, and additional explanation is provided in Appendix XI.

2.2 Annual Work Schedule

2.2.5 Other Approvals

- There is a new discussion of approvals that are required after approval of the Annual Work Schedule (Refer also to Appendix X)

2.4 Phasing - In Schedule

2.4.2 Contingency Plans

- There is a new discussion of contingency plan requirements if a Timber Management Plan will be late

Part Three: Implementation Manuals and Monitoring

Chapter 1. Implementation Manuals

- There is a revision of this entire chapter, with a revised explanation of these manuals, and MNR's commitment to follow them.

Chapter 2. Monitoring

- This chapter is completely re-written, and includes major additional commitments to monitoring. The structure is as follows:

Section 2.2 Compliance Monitoring

- Timber
- Protection of Other Resource Values

Section 2.3 Effects/Effectiveness Monitoring

- Timber
- Protection of Other Resource Values

Appendices

Appendix III. Annual Planning Procedure for Protection Operations

- There are revisions to the role played by Ministry of the Environment
- There is re-wording and corrections throughout this appendix

Appendix IX. Forest Management Units in the Area of the Undertaking

- This is a new appendix, with a new map; management units are identified by number and a list is included of all units in the province.

Appendix X. MNR Authorizing Documents

- This is a new appendix, which lists approvals required after approval of an Annual Work Schedule

Appendix XI. Procedure for Amendments to Timber Management Plans

- This is a new appendix, providing explanation of the procedure to be used for making amendments to Timber Management Plans.

SUMMARY FORM

SUMMARY FORM FOR AN ENVIRONMENTAL ASSESSMENT SUBMISSION

Re: An Environmental Assessment received from the Ministry of
Natural Resources for Timber Management on Crown Lands in
Ontario.

Environmental Assessment Number 2-77-0001-000

PART ONE: THE UNDERTAKING

(1) INTRODUCTION

Through this submission, the Ministry of Natural Resources (MNR) is
seeking approval for the undertaking of Timber Management on Crown
Lands in Ontario.

(2) PURPOSE OF THE UNDERTAKING

The purpose of the undertaking is to provide a continuous and
predictable supply of wood for Ontario's forest products industry.

(3) DESCRIPTION OF THE UNDERTAKING

Timber management consists of the following sequence of related
activities:

- (i) provision of access to harvestable timber;
- (ii) harvest of the timber for transport to wood-processing
facilities;
- (iii) renewal of that timber resource, which involves:
 - (a) preparing the site for regeneration;
 - (b) regenerating the timber by natural or artificial means;
- (iv) maintenance of the timber resource, which involves:
 - (a) tending operations to ensure successful growth of the
new forest;
 - (b) protection of the timber resource from insects and

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15
- 16
- 17
- 18
- 19
- 20
- 21
- 22
- 23
- 24
- 25
- 26
- 27
- 28
- 29
- 30
- 31
- 32
- 33
- 34
- 35
- 36

(4) IMPLEMENTATION OF THE UNDERTAKING

MNR maintains control and responsibility over the implementation of timber management through its approval of all Timber Management Plans. Authority for this control is granted through The Crown Timber Act.

(5) A CLASS ENVIRONMENTAL ASSESSMENT APPROACH

MNR has submitted a Class Environmental Assessment because it is the most appropriate approach for defining a common and consistent planning process, and for ensuring that the purpose of The Environmental Assessment Act is attained.

Amended June 1987

These activities occur in every management unit, and generally have a predictable range of environmental effects. Timber management is also dynamic in nature and the activities are carried out over a long term. The optional methods of carrying out each activity can be identified over cycles of 80 years.

The undertaking is also subject to the effects of unpredictable events such as forest fires and insect infestations. A consistent planning process provides the flexibility necessary to deal with such circumstances in a timely manner.

A class environmental assessment is submitted because it defines a common and consistent planning process which will ensure compatibility and co-ordination between management units across the province. *The common planning process* also provides a common, predictable and equal opportunity for public consultation in the preparation of Timber Management Plans for every management unit, and provides flexibility to deal with local conditions and concerns. Finally, the common planning process ensures that protection of the environment is achieved.

(6) ALTERNATIVES TO THE UNDERTAKING

- (i) The "Do Nothing/Null" Alternative: This alternative involves no utilization of the timber resources on the province's Crown lands to supply the wood requirements of Ontario's forest industry. With this alternative, wood supply would be obtained from patented land in Ontario and/or from outside the province.
- (ii) The "Harvest With No Renewal" Alternative: This alternative would involve obtaining wood from Crown land forests. However, renewal of Crown forests would be left entirely to natural forces.

Recycling (of waste paper, cardboard boxes, etc.) is assessed as providing a contribution to the purpose of the undertaking, but not

as providing a reasonable "alternative to" the undertaking.

(7) THE UNDERTAKING AND "ALTERNATIVES TO":
ADVANTAGES AND DISADVANTAGES

(i) Timber Management

The proposed undertaking provides, on a continuous basis, the kind and quantities of wood necessary to sustain a viable forest products industry in Ontario. That industry's substantial contribution to the economy of the province would continue. Communities for which the *forest products* industry is the main economic base could continue to rely on employment from that sector.

The potential negative *effects* on the natural environment associated with the undertaking can be prevented, minimized or mitigated to an acceptable level through careful planning and proper implementation of timber management operations prescribed in Timber Management Plans.

(ii) The "Do Nothing/Null" Alternative

The existing forest products industry in Ontario could not be sustained under this alternative. Negative social and economic impacts associated with this alternative, particularly in northern Ontario, would far outweigh any positive benefits to the natural environment which might result from eliminating timber management activities on Crown lands.

(iii) The "Harvest With No Renewal" Alternative

This alternative could support the industry's wood requirements for a considerable period of time. However, over time wood supplies would be less reliable and more

costly. Eventually, this alternative would result in a smaller and less competitive forest *products* industry. Serious negative and social impacts would result, particularly in northern Ontario. In addition, the lack of renewal efforts would have both short-term and long-term negative effects on the natural environment.

(8) RATIONALE FOR THE UNDERTAKING

Timber management best provides a continuous and predictable supply of wood for Ontario's forest products industry, with largely positive social and economic *impacts* and acceptable environmental consequences.

Ontario's timber resources on Crown lands offer the forest products industry a significant competitive advantage because of their quality and proximity to major world markets. The forest products industry makes a major contribution to the provincial economy and has become vital to both the economic and social well-being of the province. Many communities, particularly in northern Ontario, are dependent on the continued viability of individual mills.

Timber management as recommended by MNR provides for comprehensive planning of activities with consideration of *the concerns of other Crown land forest resource users*. As well, timber management activities will be carried out in ways that will prevent, minimize or mitigate significant environmental *effects*.

(9) ALTERNATIVE METHODS OF CARRYING OUT THE UNDERTAKING

The undertaking consists of four activities which are normally carried out in sequence: (i) provision of access to the timber resource; (ii) harvest of the timber; (iii) renewal of the timber resource; and (iv) maintenance of the timber resource.

(i) Provision of Access

Roads provide the most common form of access for timber management in Ontario.

(ii) Harvest

There are three broad alternative silvicultural systems used to harvest timber in Ontario: the clear cut, the shelterwood, and the selection silvicultural systems.

(iii) Renewal

Renewal of the timber resource may involve two separate stages: site preparation and regeneration. Site preparation is carried out to improve the probability of survival of seeds or seedlings, either by mechanical or chemical means, or by prescribed burning.

The process of regeneration may occur through natural means or artificial means. Natural regeneration relies on growth from natural seed sources, saplings which remain after harvest, or from coppice growth. Artificial regeneration involves either the sowing of seed or the planting of tree seedlings.

(iv) Maintenance

Maintenance operations may involve two activities: tending and protection. Tending consists of efforts to encourage growth of desirable trees and tree species, and may be undertaken by removing undesirable or competing vegetation. *Tending* may include thinning, or removing undesirable trees, to encourage growth of the remaining stand. *Protection* normally involves the use of pesticides for insect and disease pest control.

(10) DESCRIPTION OF THE ENVIRONMENT AFFECTED BY THE UNDERTAKING

The environment which is affected by the undertaking is broad and diverse. The environment is described in each *forest* management unit as a requirement of the timber management planning process, and is described in a general sense in Chapter 10.

The most significant *feature of* in the physical environment is the type of forest in which the undertaking takes place. Timber management in Ontario is carried out in two forest regions: the Boreal Forest Region and the Great Lakes-St. Lawrence Forest Region.

The Boreal Forest Region, which occupies the greater part of the forested area in the north of the province, is primarily coniferous. The principal tree species are white spruce, black spruce, balsam fir, jack pine, trembling aspen and white birch.

The Great Lakes - St. Lawrence Forest Region is characterized by forest stands of a very mixed nature. *The principal deciduous tree species are sugar maple, yellow birch and various oak species; the principle coniferous species are white and red pine, and hemlock.*

(11) POTENTIAL ENVIRONMENTAL EFFECTS OF THE UNDERTAKING

The environmental effects of the activities of access, harvest, renewal and maintenance are addressed separately in Chapter 11. The effects of each activity, and the *effects of* alternative methods of carrying out each activity, are discussed under the headings of aquatic effects, terrestrial effects and social, economic and cultural effects. This discussion also offers insight into the environment that is affected by the undertaking.

(i) Provision of Access

The construction of a road access system results in

temporary and permanent alterations to the environment. The effects on the aquatic and terrestrial components of the environment are primarily related to the removal of vegetative cover and soil disturbance. These direct effects may have indirect effects on water quality, streamflow characteristics and the abilities of watercourses to sustain aquatic life. Road construction may have effects on wildlife habitat, and may improve access to wildlife populations for hunting and trapping.

The provision of road access into areas previously not accessible by road has a wide range of positive and negative effects on other resources and users. Where rail or water access is used as part of the access system, there are normally fewer concerns. Those concerns are primarily related to the effects on the aquatic environment and on other users of the travelways.

(ii) Harvest

Effects of harvest operations on the aquatic environment are related to increased surface runoff and total water yield of the forested area, which may alter runoff rates and streamflow regimes. Harvest operations may also affect groundwater supplies, soil nutrient balance, evapotranspiration rates, water temperature and water quality. The severity of these effects normally diminishes over time with revegetation of sites.

The terrestrial effects of harvest operations are mainly related to the temporary loss and alteration of wildlife habitat. From a recreational and tourism viewpoint, the effects of harvest operations are related to the temporary loss of aesthetic and wilderness appeal.

Direct economic benefits are gained from the wood which is

harvested.

(iii) Renewal

Site preparation, particularly mechanical site preparation, increases the potential for erosion, because the soil is disturbed during operations. Herbicides may affect water quality, and possibly aquatic vegetation, if spills, spray drifts or surface runoff concentrate chemical herbicides.

Most of the *effects* of site preparation on recreational activities are related to aesthetics. Prescribed burning must be carefully controlled.

Regeneration has minimal adverse effects on the aquatic environment, and reduces or reverses many of the potential *adverse effects* of harvest operations. The re-establishment of forest cover will provide habitat for wildlife and will restore the aesthetic appeal of an area for tourism and outdoor recreation.

(iv) Maintenance

Temporary effects on the aquatic environment and wildlife habitat may occur through the use of chemical or biological agents for tending and protection purposes. On the other hand, chemical and biological agents used for protection operations reduce insect/ disease damage in commercial and high-value, thereby saving those forests for timber production purposes. The use of insecticides may also preserve tourism and outdoor recreational values which might otherwise be damaged or destroyed by insect pests. The maintenance of a healthy forest can also lessen potential destruction of lodges, outpost camps and facilities by reducing forest fire hazards.

PART TWO : THE TIMBER MANAGEMENT PLANNING PROCESS

(1) INTRODUCTION

All timber management activities on Crown lands are addressed in Timber Management Plans which are prepared for each forest management unit in the province. The Timber Management Plan provides specific direction for all timber management operations within a management unit.

Timber Management Plans must adhere to policies established by Cabinet and the Ministry of Natural Resources, and have regard for MNR's land use guidelines. *Within this framework, the determination of operations within a management unit is based primarily on information which pertains to that individual unit.*

(2) THE TIMBER MANAGEMENT PLAN

A Timber Management Plan must be prepared for each management unit every five years. The plan is prepared for a 20-year period, and provides long-term direction for the management of the timber resource of the management unit, and outlines details of the operations to be undertaken during the initial five-year term. At the end of that five-year term, a new plan is prepared for the next 20-year period. The new plan again provides long-term management direction for the management unit, and outlines the details of operations to be undertaken during the next five-year term.

The timber management planning process consists of four steps:

STEP ONE: ASSEMBLY AND ANALYSIS OF BACKGROUND INFORMATION

STEP TWO: DETERMINATION OF MANAGEMENT DIRECTION FOR THE
MANAGEMENT UNIT

STEP THREE: IDENTIFICATION OF POTENTIAL AREAS OF OPERATIONS

FOR THE 20-YEAR PERIOD OF THE TIMBER MANAGEMENT
PLAN

STEP FOUR: DETERMINATION OF OPERATIONS FOR THE FIVE-YEAR TERM
OF THE TIMBER MANAGEMENT PLAN

Step One: Assembly and Analysis of Background Information

Background information which contributes to the determination of the long-term direction for timber management on the management unit, and the detailed planning of operations for the five-year term, is assembled and analyzed. That background information includes MNR's Forest Resource Inventory, which provides descriptive information about the timber resource, and existing information on natural resources and land uses which is available at MNR's District offices. Contributions from other government ministries and agencies, other external participants, and the general public, are solicited as part of this information assembly.

Step Two: Determination of Management Direction for the
Management Unit

General direction for the management of the timber resource of the management unit is determined to provide for long-term continuity of management and to establish the framework within which operations will be implemented during the five-year term.

The initial requirement involves the establishment of specific management objectives for the management unit, and strategies for the achievement of those objectives. Secondly, for the various tree species or groups of species in the management unit, appropriate silvicultural systems of management are selected, and optional methods of carrying out harvest, renewal and maintenance operations for the selected silvicultural systems are determined and described in a set of Silvicultural Ground Rules. Thirdly, a calculation of the Maximum Allowable Depletion is made to determine

the theoretical upper limit of the amount of area of the management unit which could be harvested during the five-year term, assuming that the entire area is available for harvest, which is seldom the case.

Step Three: Identification of Potential Areas of Operations for the 20-Year Period of the Timber Management Plan

The land area of the management unit on which harvest, renewal and tending operations may be carried out during the 20-year period is identified. Within that land area, areas in which other resource features, land uses or values occur (i.e. "areas of concern") are identified in a preliminary way. The combination of these two pieces of information contributes to the determination of the general location(s) (i.e. 1 km wide corridors) of the new primary access roads which are required for the management unit. Alternative broad corridors for those required primary roads are considered and evaluated on the basis of effectiveness of access to areas eligible for operations, accommodation of preliminary areas of concern, and costs.

Step Four: Determination of Operations for the Five-Year Term of the Timber Management Plan

The amount of area which is selected for harvest operations and the amount of renewal and maintenance required during the five-year term are determined. The land area on which harvest, renewal and tending operations will be carried out during the five-year term is then selected from the areas previously identified as eligible for operations during the 20-year period.

Within that land area, specific "areas of concern" which require special consideration in the planning of operations are identified. Operations which will be carried out in all areas selected for operations are then determined, with comprehensive planning requirements in specific areas of concern. In the remainder of the

land area, the Silvicultural Ground Rules, previously determined in STEP TWO, will apply. These ground rules represent "normal" management practice for the management unit, and the area to which they apply becomes labelled "normal operating areas".

The comprehensive planning requirements for specific areas of concern involve a determination of whether or not operations can proceed while protecting the identified resource features, land uses or values, and if so, how. It may be decided that timber management operations will not be permitted; in such cases, a "reserve" will be established. It may be decided that "normal" operations can be carried out and still protect the identified resource features, land uses and values. Most commonly, however, it may be decided that modifications to normal operations are required; in such cases, alternative modified management prescriptions are considered and evaluated, and a specific prescription for operations is determined.

The planning of primary and secondary access roads which are required for the five-year term involves the determination of 500 metre corridors in normal operating areas and precise locations (i.e. 100 metre corridors) in specific areas of concern. Within areas of concern, alternative precise road locations are considered and evaluated in order to determine the preferred road location.

The unpredictable nature of insect and disease infestations does not permit detailed planning of protection operations on a five-year basis. Planning for these operations will be carried out annually, with annual opportunities for public consultation.

(3) PUBLIC CONSULTATION AND "BUMP-UP"

The timber management planning process provides four formal opportunities for interested and affected parties to become involved in the preparation of a Timber Management Plan: i) at the outset; ii) when preliminary proposals are developed, prior to the

production of a draft Timber Management Plan; iii) once the draft
plan is produced; and iv) after plan approval, but before
implementation.

In cases of significant public controversy, the plan or any
component of the plan (i.e. a road or a specific harvest operation)
may have to be "bumped-up" to an individual environmental
assessment. A "Bump-up" may occur at any time during the process up
to the end of the public review period of the final plan
inspection. A "Bump-up" may be voluntarily undertaken by the
Ministry of Natural Resources or requested by a member of the
public.

PART THREE: IMPLEMENTATION MANUALS AND MONITORING

(1) IMPLEMENTATION MANUALS

MNR has produced a number of manuals and guides which provide direction for the implementation of timber management operations. Some of these, such as the Silvicultural Guides, are specifically directed to ensuring that timber management operations are carried out in a consistent and functional manner. Other guidelines address how other resource values are to be taken into account during the planning and implementation of timber management operations. As well, there are additional documents which include standards and provide direction on how to prevent, minimize or mitigate potential adverse environmental effects of timber management operations.

(2) MONITORING

Monitoring forms an integral part of MNR's timber management program and has two components: (i) compliance monitoring and (ii) effects/effectiveness monitoring.

MNR monitors compliance with Timber Management Plans during and after the implementation of operations through cut inspections, contract/agreement administration and requirements for annual reports of achievements. This compliance monitoring system is supplemented by MNR's internal operational audits and five-year reviews of Forest Management Agreements (FMAs). Special audits by the Provincial Auditor and experts from outside MNR are also undertaken from time to time.

MNR monitors the effectiveness of silvicultural practices in achieving timber production objectives through regeneration surveys, and scientific research studies. The effects of timber management operations on the environment and their effectiveness in preventing, minimizing or mitigating adverse environmental effects, are monitored through inspections and scientific research studies.

MNR has recently undertaken initiatives to determine the long-term effects of timber management activities on specific resource features and values (i.e. areas of tourism value, fisheries habitat and moose habitat).

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25

26

27

28

29

30

31

32

33

34

35

36

STUDIES AND REPORTS DONE IN CONNECTION WITH THE UNDERTAKING

(1) PUBLIC AND EXTERNAL PARTICIPATION

MNR undertook a review of a draft version of this Class Environmental Assessment, beginning in September, 1983. This review involved interest groups, government ministries/agencies and representatives of the forest products and tourism industries. MNR received 41 submissions as a result of this review.

These submissions were analyzed by the Ministry and additional meetings were held with a number of the respondents to address specific issues. Beginning in February, 1985, MNR returned to the external participants to discuss how it intended to respond to the submissions in a revision of the class environmental assessment. MNR also invited submissions on these proposals and another twelve submissions were received. These responses were considered in the development of the final document.

(2) REPORTS AND DOCUMENTS

The "Timber Management Planning Manual for Crown Lands in Ontario" was produced in conjunction with this class environmental assessment. The timber management planning process and the documentation requirements for individual Timber Management Plans are outlined in this manual. This manual, which provides direction to personnel responsible for preparing these plans, was developed to reflect the planning requirements which are outlined in this class environmental assessment.

MNR has produced or revised a number of guidelines which are intended to identify possible techniques for preventing, minimizing or mitigating adverse effects of timber management operations. These guidelines include three provincial guidelines which address the protection of moose habitat, fisheries habitat and areas of tourism value in timber management. The guidelines which deal with

tourism values, for example, were developed as a result of a recent series of meetings held throughout the province involving representatives of both the tourism and forest products industries. Public consultation has and will continue to play an important role in the *development and refinement of such* guidelines.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36

**CLASS ENVIRONMENTAL
ASSESSMENT
FOR
TIMBER MANAGEMENT
ON CROWN LANDS
IN
ONTARIO**

FOREWORD

The Ontario Ministry of Natural Resources is responsible for timber management on Crown lands in Ontario. Through the submission of this Class Environmental Assessment, MNR is seeking approval under The Environmental Assessment Act for the manner in which timber management will be carried out.

Timber management is regarded as an "undertaking" as defined in The Environmental Assessment Act. Without a specific exemption being granted, that Act prohibits all such undertakings proceeding without the approval of the Minister of the Environment. That approval is obtained by submitting an environmental assessment to the Minister for his acceptance and approval.

The Ministry of Natural Resources (MNR) has carried out the undertaking of timber management pursuant to interim exemptions since The Environmental Assessment Act came into force. The present exemption provides that it will expire on December 31, 1985 unless, "A Class Environmental Assessment for Forest Management has been submitted by the Minister of Natural Resources before December 31, 1985...". If a Class Environmental Assessment is submitted in accordance with that term of the Exemption Order, the order provides that the exemption, "shall remain in effect until a decision on approval is made in respect of this (the exemption) order...".

To obtain approval under The Environmental Assessment Act, certain information must be submitted to the Minister of the Environment. The required information is described in Section 5(3) of The Environmental Assessment Act. For the undertaking of timber management, that information is contained in PART ONE of this environmental assessment.

PART ONE, Chapter 2 states the purpose of the undertaking of Timber Management as follows:

"To provide a continuous and predictable supply of wood for
Ontario's forest products industry."

PART ONE, Chapter 3 describes the activities that comprise timber management which, if carried out in an environmentally sound way, will achieve the purpose of the undertaking and the purpose of The Environmental Assessment Act. Timber management is described as the sequence of activities comprised of the provision of access to the timber resource, and the subsequent harvest, renewal and maintenance of that resource. That description is elaborated upon in PART ONE, Chapter 9, where various alternative methods of carrying out those activities are explained in detail. PART ONE, Chapter 10 provides a brief explanation of the environment where timber management takes place, and is followed, in Chapter 11, by a description of the broad range of possible environmental effects of all activities that constitute timber management. PART ONE, Chapter 11 also further describes the environment affected by the undertaking, as it outlines the possible effects of each timber management activity under the categories of aquatic, terrestrial, social, economic and cultural effects.

The requirement of Section 5(3) of The Environmental Assessment Act to examine alternatives to the undertaking is addressed in PART ONE, Chapters 6, 7 and 8. Chapter 6 describes the alternatives; Chapter 7 provides an analysis of those alternatives; and Chapter 8 explains why timber management on Crown lands, as proposed by MNR, is the most appropriate way to achieve the purpose of "providing a continuous and predictable supply of wood for Ontario's forest products industry".

This document is a Class Environmental Assessment. Therefore, the manner in which MNR proposes to meet the requirements of The Environmental Assessment Act is to obtain approval of the undertaking by demonstrating that, if the undertaking is implemented in accordance with the planning process described in PART TWO, Chapter 2, the purpose of The Environmental Assessment

Act will be achieved.

The planning process that MNR proposes to follow is described in detail in PART TWO, Chapter 2 of this environmental assessment. The process will be applied to all *forest* management units in the province, by MNR staff or by staff of forest companies. The primary product of this planning process will be a Timber Management Plan for each management unit. That plan will cover a period of five years, and will contain terms and conditions which must be adhered to by any licensee under The Crown Timber Act, when carrying out timber management operations. In addition, and perhaps most importantly, no timber management activities can be carried out in a management unit without such an approved Timber Management Plan. Regardless of who actually carries out the timber management activities, all plans are approved by MNR.

This environmental assessment contains a number of appendices related to PART TWO: THE TIMBER MANAGEMENT PLANNING PROCESS. Those parts of the planning process dealing with access roads and with operations in areas of concern to other *Crown land resource users* are elaborated upon in APPENDICES I & II. The procedure used for planning the protection of the forest from insects and disease is described in APPENDIX III. *The procedure for planning amendments to Timber Management Plans is described in APPENDIX XI.*

The description of the planning process is not complete without reference to the MNR manual entitled, "Timber Management Planning Manual for Crown Lands in Ontario"¹. In addition to describing the required contents of a Timber Management Plan, this manual describes the records which must be kept in order to facilitate efficient management of the timber resource.

PART THREE, Chapter 1 describes a variety of manuals which direct the implementation of timber management operations. These manuals describe actions which can be taken in varying situations to prevent, minimize or mitigate the effects of timber management

activities on the environment.

PART THREE, Chapter 2 addresses how MNR will monitor the implementation of approved plans.

The preparation of this Class Environmental Assessment continues along a direction which has always maintained an openness to public review and response. APPENDIX V summarizes the extensive program of pre-submission consultation undertaken by MNR following release of a draft Class Environmental Assessment in 1983.

TABLE OF CONTENTS

<u>FOREWORD</u>	ii
<u>TABLE OF CONTENTS</u>	vi
<u>LIST OF TABLES</u>	xii
<u>LIST OF FIGURES</u>	xiii
 <u>PART ONE: THE UNDERTAKING</u>	
1. <u>HISTORICAL BACKGROUND</u>	2
1.1 <u>General</u>	
1.2 <u>Legislation and Policy</u>	
2. <u>PURPOSE OF THE UNDERTAKING</u>	8
3. <u>DESCRIPTION OF THE UNDERTAKING</u>	9
3.1 <u>General Description</u>	
3.2 <u>Area of the Undertaking</u>	
3.3 <u>Management Units</u>	
4. <u>IMPLEMENTATION OF THE UNDERTAKING</u>	13
4.1 <u>General</u>	
4.2 <u>Timber Licences</u>	
5. <u>A CLASS ENVIRONMENTAL ASSESSMENT APPROACH</u>	14
5.1 <u>Justification</u>	
5.2 <u>Timeframe</u>	

6. <u>ALTERNATIVES TO THE UNDERTAKING</u>	18
6.1 <u>Alternatives To</u>	
6.1.1 The "Do Nothing/Null" Alternative	
6.1.2 The "Harvest With No Renewal" Alternative	
6.2 <u>Recycling</u>	
7. <u>THE UNDERTAKING AND "ALTERNATIVES TO":</u>	
<u>ADVANTAGES AND DISADVANTAGES</u>	20
7.1 <u>Evaluation</u>	
7.1.1 Timber Management	
7.1.2 The "Do Nothing/Null" Alternative	
7.1.3 The "Harvest With No Renewal" Alternative	
7.2 <u>Comparison</u>	
8. <u>RATIONALE FOR THE UNDERTAKING</u>	29
9. <u>ALTERNATIVE METHODS OF CARRYING OUT THE UNDERTAKING</u>	31
9.1 <u>General</u>	
9.1.1 <i>Use of Pesticides</i>	
9.2 <u>Provision Of Access</u>	
9.2.1 Roads	
9.2.2 Rail	
9.2.3 Water	
9.2.4 Air	
9.3 <u>Harvest</u>	
9.3.1 General	
9.3.2 The Clear Cut Silvicultural System	
9.3.3 The Shelterwood Silvicultural System	
9.3.4 The Selection Silvicultural System	
9.4 <u>Renewal</u>	
9.4.1 Site Preparation	
9.4.2 Regeneration	
9.5 <u>Maintenance</u>	
9.5.1 Tending	
9.5.2 Protection	

9.6 <u>Renewal And Maintenance For Different Silvicultural Systems</u>	
9.6.1 The Clear Cut Silvicultural System	
9.6.2 The Shelterwood Silvicultural System	
9.6.3 The Selection Silvicultural System	
10. <u>DESCRIPTION OF THE ENVIRONMENT AFFECTED</u>	52
11. <u>POTENTIAL ENVIRONMENTAL EFFECTS OF THE UNDERTAKING</u>	56
11.1 <u>General</u>	
11.2 <u>Provision of Access</u>	
11.2.1 General	
11.2.2 Roads	
11.2.3 Rail	
11.2.4 Water	
11.2.5 Air	
11.3 <u>Harvest</u>	
11.4 <u>Renewal</u>	
11.4.1 Site Preparation	
11.4.2 Regeneration	
11.5 <u>Maintenance</u>	
 <u>PART TWO: THE TIMBER MANAGEMENT PLANNING PROCESS</u>	
1. <u>INTRODUCTION</u>	95
1.1 <u>General</u>	
1.2 <u>Sustained Yield Management</u>	
1.3 <u>Forest Production Policy</u>	
1.4 <u>Integrated Resource Management Policy</u>	
1.5 <u>Exclusions</u>	

2. THE TIMBER MANAGEMENT PLANNING PROCESS.....

105

2.1 The Timber Management Plan

2.1.1 General

2.1.2 The Timber Management Planning Process - Plan Production

- Step One: Assembly and Analysis of
Background Information
- Step Two: Determination of Management
Direction for the Management
Unit
- Step Three: Identification of Potential
Areas of Operations for the
Twenty-Year Period of the
Timber Management Plan.
- Step Four: Determination of Operations for
the Five-Year Term of the
Timber Management Plan

2.1.3 Public Consultation and the Plan Review and Approval Process

2.1.3.1 General

2.1.3.2 Responsibilities

2.1.3.3 Production, Review and Approval of a Timber Management Plan

2.1.4 Documentation

2.1.4.1 The Timber Management Plan

2.1.4.2 Supplementary Documentation

2.1.5 Plan Renewal and Amendment

2.1.5.1 Plan Renewal

2.1.5.2 Plan Amendment

2.2 The Annual Work Schedule

2.2.1 General

2.2.2 Contents of the Annual Work Schedule

2.2.3 MNR's Review and Approval Process

2.2.4 Public Inspection

2.2.5 Other Approvals

2.2.6 Amendments

- 2.3 "Bump-up" Provisions
- 2.4 Phasing-in Schedule
 - 2.4.1 Timber Management Plans
 - 2.4.2 Contingency Plans
 - 2.4.3 Protection Operations

PART THREE : IMPLEMENTATION MANUALS AND MONITORING

1. <u>IMPLEMENTATION MANUALS</u>	185
1.1 <u>General</u>	
1.2 <u>Silvicultural Guides</u>	
1.3 <u>Manuals for the Consideration of Other Resource Values in Timber Management</u>	
1.3.1 Provincial Guidelines	
1.3.2 Other Sources of Direction	
1.4 <u>Construction and Operational Manuals</u>	
2. <u>MONITORING</u>	192
2.1 <u>General</u>	
2.2 <u>Compliance Monitoring</u>	
2.2.1 Monitoring the Timber Resource	
2.2.2 Monitoring Protection of Other Resource Values	
2.3 <u>Effects/Effectiveness Monitoring</u>	
2.3.1 Monitoring the Timber Resource	
2.3.2 Monitoring Protection of Other Resource Values	
<u>REFERENCES</u>	201

APPENDICES

- I PLANNING PROCEDURE FOR MODIFIED OPERATIONS IN AREAS OF CONCERN
- II PLANNING PROCEDURE FOR ACCESS ROADS IN AREAS OF CONCERN
- III ANNUAL PLANNING PROCEDURE FOR PROTECTION OPERATIONS
- IV PHASING-IN SCHEDULE - TIMBER MANAGEMENT PLANS
- V PRE-SUBMISSION CONSULTATION
- VI TIMBER LICENCES
- VII AN AUDIT OF MANAGEMENT OF THE CROWN FORESTS OF ONTARIO -
SUMMARY OF MNR'S ACTION PLAN (OCTOBER 1986)
- VIII MNR ORGANIZATION CHARTS
- IX FOREST MANAGEMENT UNITS IN AREA OF THE UNDERTAKING
(JUNE 1, 1987)
- X MNR AUTHORIZING DOCUMENTS REQUIRED PRIOR TO COMMENCEMENT OF OPERATIONS
- XI PROCEDURE FOR AMENDMENTS TO TIMBER MANAGEMENT PLANS

LIST OF TABLES

7.2-1	SUMMARY COMPARISON OF "UNDERTAKING: TIMBER MANAGEMENT" AND "ALTERNATIVES TO".....	28
-------	--	----

LIST OF FIGURES

3.2-1	AREA OF THE UNDERTAKING.....	10
10.1-1	THE FOREST REGIONS OF ONTARIO.....	54
1.4-1	MNR PLANNING REGIONS, ADMINISTRATIVE REGIONS AND ADMINISTRATIVE DISTRICTS.....	102
2.1-1	THE TIMBER MANAGEMENT PLANNING PROCESS - PLAN PRODUCTION...	109
2.1-2	SCHEDULE: TIMBER MANAGEMENT PLAN PRODUCTION, REVIEW AND APPROVAL.....	155
III-1	SCHEDULE: INSECT/DISEASE PEST CONTROL PROGRAM PRODUCTION, REVIEW AND APPROVAL.....	III-6

PART ONE

THE UNDERTAKING

PART ONE: THE UNDERTAKING

1. HISTORICAL BACKGROUND

1.1 General

The undertaking of timber management has a long history in the Province of Ontario. The preparation of this Class Environmental Assessment represents one important new step in this history. This chapter will review the historical background, pointing out the various elements that have shaped *the* current approach *of the* Ministry of Natural Resources (MNR) to timber management and showing the gradual evolution of a process for planning and controlling timber management on Crown lands.

The first legislated control over harvesting of timber came with The Crown Timber Act, passed in 1849. This act provided the basis for developing a timber licensing system, the essential elements being put into place over the next twenty years.

In the late 1890s and early 1900s, two events were taking place that led to important changes in legislation, and in timber management practices. First, public concern was being drawn to wasteful practices in the province's pine forests of southern Ontario, which led to Ontario's initial efforts in artificial regeneration. During the same period, the pine sawlog industry began to decline, and interest shifted to the development of a pulp and paper industry based on the vast spruce forests of northern Ontario. By the late 1920s, this industry was well-established with 13 mills.

Between 1927 and 1929, the Legislature of Ontario passed a number of acts related to timber management. The most important were The Provincial Forests Act, which permitted public lands to be set aside to protect future timber supplies, and The Pulpwood Conservation Act. This act introduced the concept of sustained

yield management into legislation, by requiring all pulp companies with licensed holdings on public lands to manage the Crown forests on a sustained yield basis.

These statutes embodied the basic principles of sound timber management . However, in practice, they were ineffective, largely due to the economic depression of the 1930s. As well, The Crown Timber Act of that time was based on two *faulty* assumptions -- that the sawlog and pulp industries could expand infinitely, and that the province's timber resources were inexhaustible. In general, the period from 1930 to 1949 was one of exploitation of timber resources with very little done to ensure that industry complied with The Pulpwood Conservation Act.

During the 1940s, the Ontario Department of Lands and Forests was reorganized, and in 1947, the Kennedy Royal Commission on Forestry was formed. These two developments led to a renewed emphasis on the need for sound timber management, and a recognition that public funds must be invested to ensure forests for the future.

The Forest Management Act of 1947 embodied the most recent attitudes toward timber management. This legislation gave all companies in the forest products industry equal responsibility for timber management, and it was this legislation that first required the production of forest management plans. As is the case today, these plans had to be reviewed and approved by the provincial government, and operations had to conform to approved plans. In addition to these new planning requirements, the forest companies were made responsible for the regeneration of the areas harvested.

On the majority of Crown lands, the government's role was to license companies and approve and supervise their activities. Government foresters actually carried out timber management only on Crown lands that were not under licence to the large companies of the forest products industry.

The period following the Second World War was a time of greatly increased effort in timber management. That effort led to the increased employment of professional foresters and technicians, both by government and companies. It was also during this period that timber harvesting became largely mechanized.

In 1953, a new Crown Timber Act was passed, which consolidated and revised a number of the statutes that governed the administration of timber resources on Crown lands. The legislation replaced all the old formal agreements with 21-year licences issued by Order-in-Council.

Under the new Crown Timber Act, the forest products companies remained responsible for planning, harvesting and regeneration. However, little artificial regeneration of harvested areas was actually carried out, partly because of the industry's reluctance, and partly because the expertise necessary to regenerate forests was not well developed. What expertise existed remained largely with government foresters. As well, early reforestation efforts in northern Ontario during the 1950s relied on experience, and often on planting stock, that had been developed in the reforestation of sandy lands of southern Ontario. These efforts often failed when used in the vastly different soils and climate of the north. It was some time before the regeneration techniques were developed that were appropriate to the cutover boreal forests of Ontario.

By 1960, it was clear that the existing system was not providing for effective regeneration. In response, The Crown Timber Act was amended in 1962 and full responsibility for regeneration was assigned to the province. The government's fledgling efforts and accomplishments in regeneration increased greatly as a result of this shift of responsibility. The Ontario Department of Lands and Forests also recognized by the mid-1960s that silvicultural expertise had to be developed within a comprehensive management framework, in order to ensure sustained yield timber production. This was stressed in a 1967 study by the Brodie Study Unit. This

recognition also led to the development of the Forest Production Policy (Refer to PART TWO, Chapter 1) and its approval by the government of Ontario in 1972. This policy provided direction for long-term timber production and spending of public funds for timber management, particularly regeneration.

Meanwhile, new problems had developed since the government had assumed responsibility for regeneration. The harvesting methods that were efficient and effective for the industry were causing difficulties for the government's regeneration efforts. The problems caused by the separation of harvesting and regeneration efforts were recognized by the government's Special Program Review of 1975 and the Armson Report: "Forest Management in Ontario" (1976)². Both of these reviews recommended that the forest products industry resume full responsibility for regeneration and retain their existing responsibility for harvesting.

A new means of negotiating and formalizing the specific responsibilities for timber management was developed during 1978 and 1979, when the Ministry of Natural Resources and the major pulp and paper companies agreed upon the development of Forest Management Agreements (FMAs). In 1979, The Crown Timber Act was amended to allow the Minister of Natural Resources to enter into these agreements with companies of the forest products industry. The general approach of the Forest Management Agreements is to provide the companies with the clear responsibility for the majority of the activities of timber management, through a negotiated agreement with the Minister of Natural Resources.

By June 1, 1987, 29 Forest Management Agreements (FMAs) had been signed, covering approximately 67 per cent of the Crown lands under timber licence in Ontario. The aim of MNR is to enter into these agreements with the majority of the large licence holders in the province. This would have the result of placing a total of about 70 per cent of the Crown lands licensed in the province under Forest Management Agreements about 243,000 square kilometres.

In 1975, The Environmental Assessment Act was passed and required compliance for all activities of the Ministry of Natural Resources, including timber management. This new legislation provided one further step in the continued development of MNR's approach to timber management on Crown lands.

Since that legislation was passed, timber management on Crown lands has proceeded under an interim exemption from the Act. This has been necessary while an approach for treating timber management activities was being prepared. Extensions to the Exemption Order over the past few years have been accompanied by binding conditions. Currently, the conditions require:

- (i) public consultation in the preparation and review of management plans;
- (ii) for proposals for primary forest access roads on Crown Management Units, consideration of alternative locations and their environmental implications; and
- (iii) public notice prior to the aerial spraying of herbicides and insecticides.

This Class Environmental Assessment describes a planning process for timber management which has evolved from the revision of MNR's existing timber management planning process, with the requirements of The Environmental Assessment Act taken fully into account. Once approved, that improved planning process will apply to all timber management planning on Crown lands within the area of designated "forest management units" in Ontario depicted in FIGURE 3.2-1 (Refer to PART ONE, Section 3.2).

1.2 Legislation and Policy

In the planning and implementation of timber management operations, MNR complies with all applicable legislation, regulations and government policy. For example, it is necessary to comply with federal and provincial legislation with respect to the use of

pesticides and occupational health and safety.

The legislation which most directly affects timber management in Ontario is The Crown Timber Act. This legislation provides the major enforcement mechanism through which MNR will ensure that the requirements of this Class Environmental Assessment, and the terms and conditions of its approval, are met by all parties who undertake timber management activities. It is understood by MNR that The Crown Timber Act requires some alterations to improve the clarity of the legislation and to provide for more effective enforcement. For these reasons, MNR will seek appropriate amendments to The Crown Timber Act from the Legislature of Ontario.

Because of the historical context and geographical extent of timber management on Crown lands in Ontario, local native communities can be specifically affected by timber management activities. MNR is aware of, and involved in, on-going negotiations between the governments of Canada, Ontario and the other provinces, and Canada's native people. These discussions involve a number of issues such as: the definition of aboriginal and treaty rights in The Constitution Act, 1982; the effect of constitutional entrenchment of those rights; and a number of resource-related matters that arise due to the special status of Indians.

Since some of these very basic issues are, as yet, unresolved, it is not possible to define and assess the potential impacts of timber management activities on aboriginal or treaty rights in this Class Environmental Assessment. However, the potential effects of timber management on the actual activities and pursuits of native people are amenable to resolution at the local level during the planning of timber management operations. This planning can be undertaken whether or not a specific local native concern is ultimately determined to be a "treaty or aboriginal right". It is the policy of the government of Ontario to consult specifically with the native people when managing natural resources.

2. PURPOSE OF THE UNDERTAKING

The purpose of the undertaking is to provide a continuous and predictable supply of wood for Ontario's forest products industry.

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25

26

27

28

29

30

31

32

33

34

35

36

3. DESCRIPTION OF THE UNDERTAKING

This chapter describes the activities which comprise the undertaking. It also describes where those activities can occur.

3.1 General Description

Timber management consists of the following sequence of related activities:

- (i) provision of access to harvestable timber;
- (ii) harvest of the timber for transport to wood-processing facilities;
- (iii) renewal of that timber resource, which involves:
 - a) preparing the site for regeneration;
 - b) regenerating the timber by natural or artificial means;
- (iv) maintenance of the timber resource, which involves:
 - a) tending operations to ensure successful growth of the new forest;
 - b) protection of the timber resource from insects and disease.

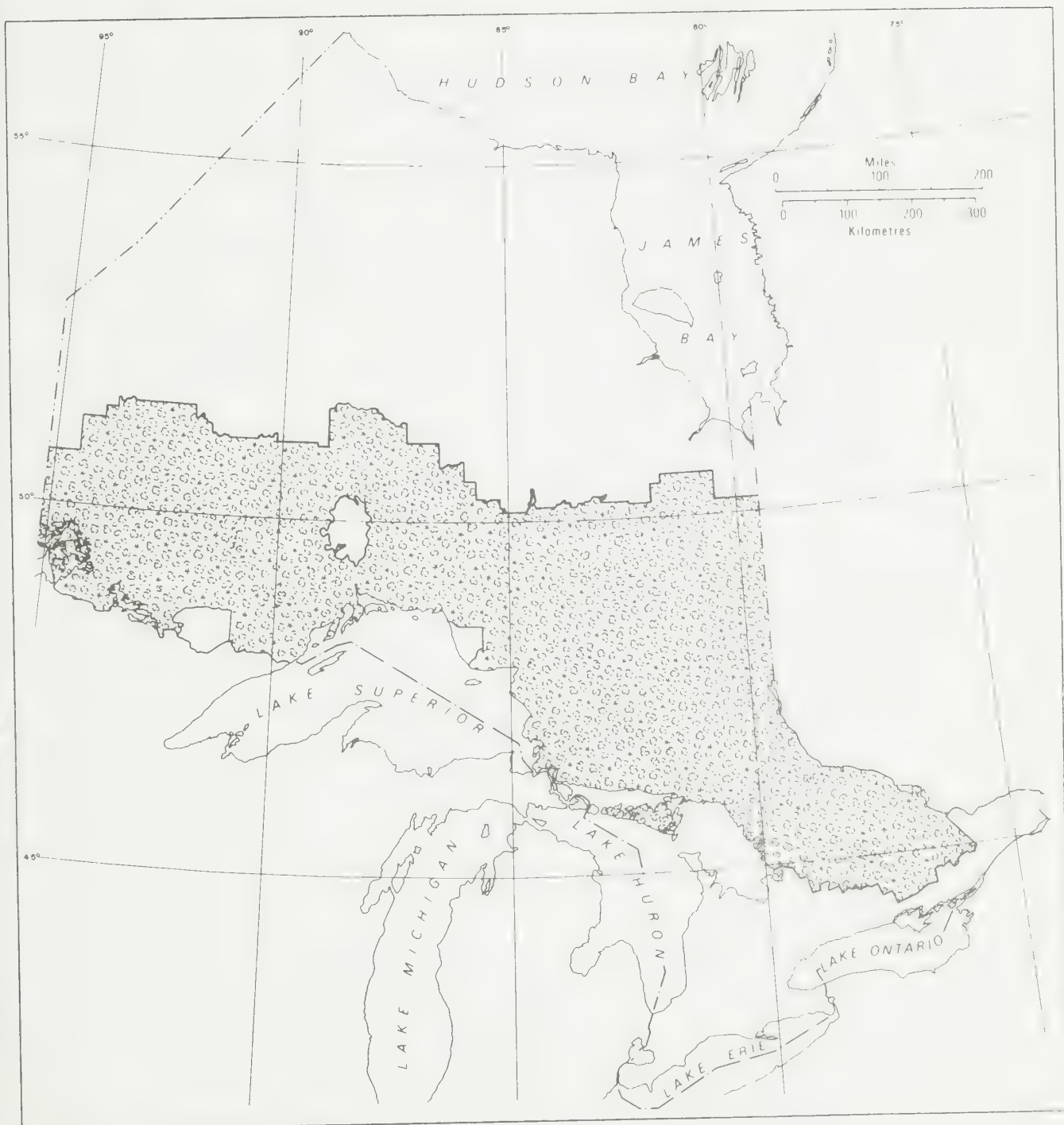
A fuller appreciation of the undertaking can be obtained by reference to PART ONE, Chapter 9, which contains a detailed description of these timber management activities.

3.2 Area of the Undertaking

The undertaking occurs on most of the forested parts of the province, excluding parts of southern, and all of southwestern Ontario. The undertaking occurs only on Crown lands, and currently on only those Crown lands within the area of "forest management units" depicted on FIGURE 3.2-1. As described in PART TWO, timber management activities will be carried out on defined areas of those management units only.

FIGURE 3.2-1

Area of the Undertaking



In the future, the undertaking may also occur on any other Crown lands in Ontario which may be added to the area of designated forest management units depicted on FIGURE 3.2-1.

3.3 Management Units

As shown on the map of forest management units in the area of the undertaking in APPENDIX IX, the Crown lands upon which this undertaking currently occurs are subdivided for the purpose of timber management. These subdivisions, or forest management units, are established by Order-in-Council pursuant to The Crown Timber Act. A forest management unit can be defined as a forest estate, organized for efficient administration and control, which is actively managed for the continuous commercial production of timber in accordance with a single management plan.

Three types of forest management units are recognized in Ontario, each reflecting a particular form of timber licensing (Refer to PART ONE, Section 4.2 and APPENDIX VI). These types of forest management units are:

- (i) Crown Management Units, where the Ministry of Natural Resources prepares Timber Management Plans and may carry out timber management operations itself. The Ministry may also contract operations to individuals or companies or issue short-term licences (up to five years) to companies which then carry out operations according to the approved plan prepared by MNR.
- (ii) Company Managements Units are units licensed to large forest companies which play a greater role in timber management. The large companies have professional foresters on staff and are able to carry out the planning as well as some timber management operations. Planning, provision of access and harvest operations are all carried out by the companies; however, the Ministry will normally carry out the activities

of renewal and maintenance (or contract these functions to individuals or companies).

- (iii) **Forest Management Agreement Forests (FMAs)** are similar to Company Management Units, in that these management units are licensed to large companies. The major difference is that the companies *have agreed*, through negotiated agreements with the Minister of Natural Resources, to carry out the planning, and all operational aspects of timber management, except *protection operations (i.e. insect and disease pest control)*.

4. IMPLEMENTATION OF THE UNDERTAKING

4.1 General

The activities which comprise the undertaking of timber management can proceed only if they conform to the requirements of Timber Management Plans approved by MNR. A Timber Management Plan must be prepared for each management unit, following the planning process described in PART TWO, Chapter 2. Upon approval of the plan, the various activities that comprise timber management (i.e. access, harvest, renewal, and maintenance) can be implemented. These operational activities must comply with the specific requirements in each Timber Management Plan.

MNR maintains control and responsibility over the implementation of timber management through its approval of all Timber Management Plans for all types of management units. In all cases, approval must be granted by MNR's Regional Director and the Director, Timber Sales Branch, Forest Resources Group, Main Office. Authority for this control is granted through The Crown Timber Act which requires Timber Management Plans to be prepared, and operations to be carried out in accordance with those plans.

4.2 Timber Licences

Timber licences provide the authority to cut Crown timber. The licences are issued under the authority of The Crown Timber Act, and come in a variety of forms (Refer to APPENDIX VI). Regardless of the form of the licence, and regardless of who is granted the licence, all the activities must conform to a Timber Management Plan approved by MNR.

5. A CLASS ENVIRONMENTAL ASSESSMENT APPROACH

5.1 Justification

Interpretations of The Environmental Assessment Act have provided for the use of "class environmental assessments" for common sets of activities. This approach is predicated on the basis that an acceptable planning process is developed in the class environmental assessment for application whenever and wherever the undertaking is carried out.

Timber management is well-suited to this approach because it involves a common set of activities wherever practised. Although these activities are diverse, they are interrelated and all play a role in the achievement of the purpose of the undertaking. Although the individual activities of provision of access, harvest, renewal and maintenance are performed in different ways in different management units, certain characteristics are common to all locations:

- (i) The activities which comprise the undertaking (access, harvest, renewal and maintenance) occur in every management unit, and are practised in a reasonably similar manner within each of two forest regions: *the Boreal Forest Region and the Great Lakes - St. Lawrence Forest Region* (Refer to *PART ONE, Chapter 11*). The descriptions of timber management operations in *PART ONE, Chapter 9* elaborate upon this point.
- (ii) There are generally predictable ranges of environmental effects for each activity, as described in *PART ONE, Chapter 11*.
- (iii) The optional methods of carrying out each activity, and the criteria for choosing the most appropriate method, can be identified.

In determining the appropriateness of the class environmental assessment approach, the nature of the undertaking itself is also an important factor to be considered. Timber management is also an activity that does not have a completion point. Rather, this undertaking consists of a series of interrelated activities which are carried out on a continuous basis. In addition, the activities repeat themselves over a long-term cycle, since it normally takes at least 80 years for a harvested forest to be *renewed* to the point where harvest can once again take place.

There is also a dynamic nature to timber management, in that the decisions made for any specific activity, or the results of those decisions, may affect the options available for subsequent activities. For example, the decision on harvest techniques can affect the options available for regeneration, and the success of regeneration will determine requirements for maintenance. The undertaking is also subject to the effects of unpredictable events such as forest fires or insect infestations.

In recognition of all these facts, any approach to timber management must maintain enough flexibility to deal with the dynamic and sometimes unpredictable nature of timber management. Experience has shown that application of a common planning process to all management units is possible, and MNR contends that the consistency achieved by doing so is a vital asset. Application of a consistent process is the only way to ensure compatibility between *forest* management units across the province. Without this approach, it is virtually impossible for MNR to assess systematically what is occurring across the province, or to apply a reasonable level of control, to ensure *that* the purpose of the undertaking is achieved. The common planning process also means a common, predictable and equal opportunity for public consultation in the preparation of *Timber Management Plans* for every management unit, and provides flexibility to deal with local conditions and concerns. This *approach* provides a level of fairness to all involved, as well as a manageable process for MNR, companies, and

broad-based interest groups.

Furthermore, MNR takes the position that the planning process outlined in this Class Environmental Assessment ensures that adequate protection of the environment is achieved. In the planning of operations for each management unit, concerns of other Crown land resource users are addressed through the identification of areas in which resource features, land uses and values which may be negatively affected by timber management operations occur. For such areas, termed "areas of concern", comprehensive planning of operations is required, and the resultant specific operational prescriptions are designed to ensure that potentially adverse environmental effects are prevented, minimized or mitigated.

For the remainder of the area of operations, where no particular resource features, land uses or values which could be negatively affected by timber management operations are identified, the range of acceptable silvicultural practices which can be employed are determined by practising professional foresters. Those practices represent "normal" timber management practice for the management unit, and the area of operations to which they apply is termed "normal operating areas". Those acceptable silvicultural practices are designed to ensure that the main elements of the environment which require protection in such areas, namely the timber resource itself and related soils and site characteristics, are protected, and that potentially adverse environmental effects are prevented or minimized.

MNR has submitted a class environmental assessment because it is the most appropriate vehicle for defining a common and consistent planning process, and for ensuring that the purpose of The Environmental Assessment Act is attained. Furthermore, the class environmental assessment approach has the added advantage of allowing matters such as the purpose of the undertaking, the rationale for the undertaking, and alternatives to the undertaking, which are the same for all management units, to be dealt with on a

generic basis.

The use of a class environmental assessment, and application of a common planning process, will best meet the needs of MNR and the purpose of The Environmental Assessment Act in the majority of cases. However, MNR recognizes that there may be special situations in particular management units where this approach may not entirely satisfy all parties involved. Therefore, this class environmental assessment provides opportunities for a "Bump-up" to an individual environmental assessment in such cases (Refer to PART TWO, Section 2.3). The Minister of the Environment will have the authority to decide on whether a "Bump-up" is appropriate.

5.2 Timeframe

In submitting this Class Environmental Assessment, MNR is requesting that the approval of the environmental assessment remain in effect for at least six years. The first five years will allow complete phasing-in of the planning process to all management units. In the sixth year, MNR will review this Class Environmental Assessment in light of experience gained through its application. The purpose of this review will be to determine whether *this* Class Environmental Assessment remains appropriate, or whether specific changes to the document, or to the overall approach, are warranted. MNR will then submit its recommendations to the Minister of the Environment before the end of the sixth year. By the end of the sixth year, the Minister of the Environment will make the decision on whether the approval should be extended, amended or revoked.

6. ALTERNATIVES TO THE UNDERTAKING

6.1 Alternatives To

6.1.1 The "Do Nothing/Null" Alternative

The wood requirements of Ontario's forest products industry could be supplied from sources other than the province's Crown lands. Currently, some of industry's wood requirements are obtained from patented lands in Ontario; in 1978, for example, 19 per cent of the province's total roundwood production was obtained from patented lands. Greatly increased production from those patented lands could contribute, at least in part, to the achievement of the industry's wood requirements.

Assuming the availability of wood supplies with no or minimal market and institutional constraints, all or part of industry's wood requirements could also be imported from outside the province (e.g. from neighbouring provinces and/or the border states of the U.S.A.).

This alternative, which could be described as the "Do Nothing" or "Null" alternative, implies no use of the timber resources on the province's Crown lands to supply the continuous wood requirements of Ontario's forest products industry. Rather, each of the options previously described could supply those requirements independently, or perhaps more feasibly, in combination.

6.1.2 The "Harvest With No Renewal" Alternative

The wood requirements of Ontario's forest products industry could be supplied from the province's Crown lands without directing additional management efforts towards forest renewal. This alternative, which could be described as the "Harvest With No Renewal " alternative, would be entirely harvest and extraction-oriented. Renewal of the forest to supply the continuous

wood requirements of the forest products industry would be left
entirely to natural forces.

6.2 Recycling

While incapable of supplying a major portion of the raw material
requirements of Ontario's forest products industry, recycling of
previously-processed wood products provides a significant
contribution towards the production of specific end-products - in
particular, paper and cardboard. It is estimated that 35 to 40 per
cent of previously-processed paper products used in Ontario are
recycled. Because of the substantial export role of Ontario's pulp
and paper industry, however, large volumes of post-consumer
products are simply not available domestically for recycling in
sufficient volumes to sustain the existing pulp and paper industry.

In the lumber and veneer industries, recycling is virtually a
non-existent and impractical consideration as an alternative source
of wood supply.

Recycling, therefore, while acknowledged as an important
contribution to the raw material requirements of specific sectors
of Ontario's forest products industry, is not considered as a
reasonable "alternative to" for purposes of this environmental
assessment.

7.	<u>THE UNDERTAKING AND "ALTERNATIVES TO": ADVANTAGES AND DISADVANTAGES</u>	1
		2
		3
7.1	<u>Evaluation</u>	4
		5
7.1.1	Timber Management	6
		7
	Timber management on Crown lands in Ontario provides a continuous and predictable supply of wood for Ontario's forest products industry. The industry manufactures a large variety of wood products for domestic needs and export markets, particularly in the U.S.A., and therefore makes a major contribution to the provincial economy. Statistics for 1983 indicate that the industry generated more than \$3 billion value added and provided approximately \$2.6 billion in export revenues.	8
		9
		10
		11
		12
		13
		14
		15
		16
	Ontario's forest products industry provides approximately 80,000 jobs directly, and approximately the same number of jobs indirectly in support services and industries. The direct employment is provided in woods operations and more than 800 primary wood-processing facilities throughout the province. The forest products industry is the predominant base for industrial development in many parts of northern Ontario. Forest sector employment accounts for 45.1 per cent of total manufacturing employment in northern Ontario and 78.5 per cent in the economic region of northwestern Ontario. More than 20 northern Ontario communities are either entirely or predominantly dependent upon the forest industry for their economic well-being. For example, pulp and paper companies account for 40 to 60 per cent of all employment in the towns of Kapuskasing, Red Rock-Nipigon, Terrace Bay-Schreiber, Iroquois Falls, Marathon and Smooth Rock Falls.	17
		18
		19
		20
		21
		22
		23
		24
		25
		26
		27
		28
		29
		30
		31
		32
	The forest products industry is also the source of considerable revenues for both the provincial and federal governments. Statistics for 1981 indicate that the industry provided approximately \$262 million in direct provincial government	33
		34
		35
		36

revenues, primarily through stumpage and area charges, corporate income tax, personal income taxes of direct employees, and provincial retail sales taxes from direct employees and industry. The corresponding figure for direct federal government revenues is \$325 million.

Timber management is long-term, and is directed to ensuring a continuity of wood supply and economic stability for numerous communities which depend on the forest products industry as the primary industry and employer. Timber management generally aims to make production and harvest of the timber resource as efficient as possible. Increasingly, management efforts and expenditures are directed to sites with the greatest production potential and to the creation of new forests better structured to meet Ontario's future needs.

Government expenditures on comprehensive timber management planning, forest renewal, and proper implementation of timber management operations are sizable and long-term investments. Also, they are crucial in order to sustain and provide opportunities for the further development of the province's forest products industry.

Timber management operations potentially may cause a variety of environmental effects, which are described in PART ONE, Chapter 11. These effects may be positive or negative, short-term or long-term, direct or indirect, temporary or irreversible, cumulative and residual. Environmental effects are comprehensively addressed in the timber management planning process. Most effects can be prevented or minimized through proper planning and implementation of timber management operations, or mitigated through the use of remedial measures; some effects will have to be accepted as the inevitable consequences of the undertaking.

7.1.2 The "Do Nothing/Null" Alternative

This alternative would involve major implications to the forest products industry which is currently dependent on Crown lands for most of its wood requirements.

The option of importing all or part of the wood requirements of the forest products industry might sustain that part of the industry's manufacturing base which is required to process the province's domestic requirements for wood products. It would not, however, sustain production of wood products for export. In either case, it is highly likely that the existing market and institutional constraints on that importation could not be overcome. As a result, a major portion of the manufacturing base of the industry which is devoted to the production of wood products for export would be eliminated.

The option of greatly increased production from patented lands could not be expected to independently sustain that part of the industry's manufacturing base which is required to process the province's domestic requirements for wood products, let alone contribute to the production of wood products for export.

Productive forest on patented land comprises approximately 15 per cent of the total productive forest land of the province. Somewhat more than half of that forest is located in agriculturally developed southern Ontario and more than two-thirds is in the Great Lakes - St. Lawrence Forest Region. In northern Ontario, patented lands occur in the vicinity of a number of northern communities with a local agricultural industry, or as freehold land holdings of the railroad industry, and to a lesser extent, the forest products industry.

Less than 20 per cent of the patented land area of southern Ontario is forested, and not all of that land area can be considered to be productive. That limited land area could not be expected to supply the wood requirements of the forest products industry, even with

much more intensive management efforts. Large-scale conversion of the limited agricultural land area of Ontario to intensive management of modern, fast-growing, highly productive, genetically-improved tree species is also not a practical alternative. Furthermore, much of Ontario's forest products industry is based on the tree species which are found in the Boreal Forest Region. The tree species of southern Ontario are not satisfactory for much of the forest products industry, nor could the boreal species be successfully produced in southern Ontario.

Realistically, a combination of this option and the wood importation option would be required. Again, however, it would be expected that a major portion of the manufacturing base of the forest products industry, which is devoted to the production of wood products for export, would be eliminated.

Each of the options within this alternative would have significant social and economic implications. For the wood importation option, significant negative social and economic implications would be involved, such as:

- substantial industry expenditures for the acquisition of roundwood raw material from outside the province;
- dependency on external sources of supply, with the associated supply and cost uncertainties;
- substantial expenditures for the transportation of roundwood raw material to existing wood-processing facilities closer to the roundwood supply base (i.e. Great Lakes shorelines, provincial borders, etc.) in order to minimize transportation costs;
- closure of many wood-processing facilities, particularly those in communities in the northern interior of the province, because wood acquisition and transportation costs would be prohibitive;
- loss of all jobs in the harvest and forest renewal sectors of the industry;

- loss of jobs in the wood-processing sector of the industry as well, where wood-processing facilities would be closed;
- loss of government revenues from stumpage and area charges, and from lost jobs;
- loss of sizable export revenues, with the associated increased expenditures for wood imports; and
- loss of the value of the capital assets of those wood-processing facilities which would be closed.

Most of the significant negative social and economic consequences associated with the wood importation option would also apply to the option of greatly increased production from patented lands as well. For some of those consequences, however, the severity and magnitude of the effects could be considered to be somewhat less (e.g. dependency on external sources of wood supply, transportation expenditures, industry relocation expenditures, loss of jobs in harvest and forest renewal sectors of the industry, and loss of government revenues from lost jobs).

While government expenditures under these options would be reduced, some incentives or subsidies to private landowners would be required. These expenditures would be directed, in particular, to nursery production of tree seedlings, reforestation assistance and professional consultation in the management of established timber crops. Also, in both cases, large government expenditures would be required to create and maintain jobs in communities where forest products companies would fail, and to facilitate the re-structuring of the forest products industry.

The environmental effects of this alternative, and each option within it, would not be great. For the wood importation option, which implies no harvest or forest renewal activities within the province, obviously none of the effects *on the natural environment* which are described in PART ONE, Chapter 11 would occur. For the option of greatly increased production from patented lands, essentially the environmental effects described in PART ONE,

Chapter 11 would be displaced from Crown lands to patented lands. However, because patented lands could not be expected to supply independently the wood requirements of the forest products industry, the geographical extent of those environmental effects would be considerably smaller. The severity and magnitude of the effects, however, might be expected to be somewhat greater on those lands which would be affected, because of the greater intensity of timber management efforts which would be needed.

7.1.3 The "Harvest With No Renewal" Alternative

This alternative would involve major medium and long-term implications to the forest products industry. While the industry's wood requirements could be supplied for a considerable period of time (i.e. an estimated 80 to 100 years), the industry would become increasingly dependent on less productive, lower quality forests at greater distances from the wood-processing facilities. Ultimately, it would become increasingly difficult to maintain efficiency and, consequently, the competitiveness of the province's forest products industry in a highly competitive world forest industry. In short, neither government nor industry would have any control over the nature of the forests to supply future requirements.

Moreover, there would eventually be a shortfall in wood supply, particularly of desirable and valuable high quality tree species. Ultimately, the problems of wood supply, and more critically, accessible wood supply, would result in a considerable reduction of the forest products industry in the province, particularly in northern Ontario.

The social and economic benefits associated with "The Undertaking: Timber Management", as described in PART ONE, Section 7.1.1, could be expected to apply to this alternative as well, but only for a period of time. An exception would be in terms of employment, where no jobs would be available in the forest renewal sector of the industry. None of the substantial government expenditures

associated with forest renewal would be incurred, but neither would the long-term economic benefits resulting from forest renewal efforts be realized.

However, as decreased efficiencies of production become an increasing concern, it would be expected that initially the reduction in competitiveness of the industry would detrimentally affect export sales, thereby reducing production for that market. This in turn would lead to a reduction of the industry itself, with significant social and economic consequences, such as:

- a reduced contribution to the provincial economy;
- reduced numbers of jobs;
- reduced government revenues;
- reduced export revenues;
- closure of some wood-processing facilities;
- major disruption and upheaval of several communities dependent on the forest products industry, particularly single-industry small communities in northern Ontario; and
- loss of the sizable value of the capital assets of those wood-processing facilities which would be closed.

Ultimately, the limited wood supply situation would result in a major reduction of the industry, compounding the kinds of social and economic consequences previously described. Large government expenditures would be required to create and maintain jobs in communities where forest products companies would fail. The inability of the industry to supply even the province's domestic requirements for wood products could eventually become a reality, resulting in major expenditures for the acquisition of manufactured wood products from outside the province.

Since operations would be entirely oriented to harvest and extraction, the environmental effects associated with the provision of access and harvest operation for "The Undertaking: Timber Management", as described in PART ONE, Chapter 11, would also be

expected to occur. While none of the negative effects which are described in PART ONE, Chapter 11 for forest renewal and maintenance operations would occur, the positive effects of management efforts to assist in re-establishment of forests on harvested lands, particularly to encourage desirable and valuable high quality tree species, would also not occur.

Ultimately, as operations extend into forests farther and farther from the wood-processing facilities, and as less productive, lower quality forests become critical sources of wood supply, the extent, severity and magnitude of most of the negative environmental effects of operations could be expected to increase substantially.

7.2 Comparison

Table 7.2-1 presents a relative comparison of "The Undertaking: Timber Management" and the "Alternatives To", according to a number of criteria.

TABLE 7.2-1

SUMMARY COMPARISON OF "UNDERTAKING: TIMBER MANAGEMENT" AND "ALTERNATIVES TO"

CRITERIA	"TIMBER MANAGEMENT"	"DO NOTHING/NULL"		"HARVEST WITH NO RENEWAL"
		Wood Importation	Increased Production From Patented Lands	
Wood Supply Source	Supply continuous and predictable	Supply limited and unreliable	Supply limited because of land base	Supply increasingly more unpredictable and limited over time
ECONOMIC IMPLICATIONS				
(a) contribution to provincial economy	Major contribution	Limited contribution	Limited contribution	Major contribution now; decreasing over time
(b) export revenues	Major contribution	None	Very limited	Major contribution initially; declining over time
(c) government revenues	Significant contribution	Very limited	Limited	Significant; declining over time
(d) government expenditures	Significant investment requirement	Significant expenditures for community maintenance and to facilitate restructuring of industry	Significant expenditures for community maintenance and to facilitate restructuring of industry	Limited initially; increasing over time
SOCIAL IMPLICATIONS				
(a) employment opportunities	Major source; critical in N. Ontario	Major reduction and geographical displacement	Significant reduction in areas where Crown lands predominate	Major contribution now; declining over time
(b) stability of industry and dependent communities	Major stabilizing force; critical in N. Ontario	Major disruptions, particularly in N. Ontario	Disruptions would occur; most significant where patented lands are limited	Significant stabilizing force now; declining over time
ENVIRONMENTAL IMPLICATIONS	Acceptable, with proper planning and implementation	Few, if any	Significant impacts on relatively small areas	Unacceptable

8. RATIONALE FOR THE UNDERTAKING

PART ONE, Chapter 7 presents an analysis of alternative ways of achieving the purpose described in PART ONE, Chapter 2. Based on this analysis, the Ministry has concluded that "The Undertaking: Timber Management" is the best way of achieving the purpose. In addition, the undertaking has advantages which the alternatives do not provide.

The province of Ontario is fortunate to have available, under the ownership of the Crown, a vast area of land presently supporting, and capable of producing in perpetuity, a renewable timber resource. In particular, much of Ontario's timber resource consists of high-quality coniferous wood fibre for pulp and paper production, offering Ontario a considerable competitive advantage in the lucrative export market of the U.S.A.

As described in PART ONE, Section 7.1.1., the forest products industry is vital to the economic and social well-being of the province, in particular northern Ontario with its numerous forest industry-dependent communities. The industry makes a major contribution to the provincial and national economy, generating substantial export earnings and offering the potential for considerably more. The industry supplies large taxation revenues for government, and provides well-paid employment for large numbers of people directly in the industry and indirectly in support services and industries.

Industrial demand for wood is expected to continue to increase. In particular, demand for high-quality wood fibre for the pulp and paper industry from Ontario's Boreal Forest Region can be expected to increase. Moreover, export demands from countries with inadequate timber resources can be expected to increase substantially, despite the rapidly increasing competition from South America and the southern U.S.A., with their more favourable climate and faster-growing high-quality tree species.

At the same time, the land area in Ontario available for production of required wood supplies is finite and increasingly remote. In fact, that land area is decreasing, as demands for other uses on those lands remove land from timber production. Therefore, increased production is required from available lands, particularly the most productive and accessible lands, necessitating increased management efforts and stewardship to ensure a continuous supply of raw material.

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25

26

27

28

29

30

31

32

33

34

35

36

9. ALTERNATIVE METHODS OF CARRYING OUT THE UNDERTAKING

9.1 General

As described in PART ONE, Chapter 2, the undertaking of timber management consists of the following sequence of activities:

- (i) provision of access to the timber resource;
- (ii) harvest of the timber;
- (iii) renewal of the timber resource (i.e. site preparation and regeneration); and
- (iv) maintenance of the timber resource (i.e. tending and protection).

This chapter describes the various methods available and in use in Ontario to carry out each activity. As is evident in the following descriptions, the choice of method(s) for any one activity often will be linked to the method chosen for another of the activities.

In the preparation of a Timber Management Plan, this choice between alternative methods is based on a combination of considerations such as:

- the characteristics of the forest (Refer to PART ONE, Chapter 10 for a description of the forest regions of Ontario within which the undertaking of timber management is carried out);
- the site conditions, such as soil type and depth, slope and drainage;
- relative costs of alternative methods; and
- interests and concerns of other users of the forest.

9.1.1 Use of Pesticides

The use of pesticides is an important component of timber management in Ontario, primarily involving the aerial application

of herbicides and insecticides. As described in PART ONE, Sections 9.4.1 and 9.5.1 respectively, herbicides may be used as a site preparation technique in the renewal activity, and as a method of tending in the maintenance activity. Insecticides and fungicides are used as methods of protection in the maintenance activity, as described in PART ONE, Section 9.5.2.

Only federally registered pesticides which are approved for use in Ontario by the Ontario Ministry of the Environment (MOE) are used in timber management. The federal Pest Control Products Act and The Ontario Pesticides Act are the two key pieces of legislation which govern the registration and use of pesticides, ensuring that all pesticides registered and approved for use in timber management have been tested and are judged not to pose an environmental or human health hazard.

MNR is committed to the safe and responsible use of pesticides for timber management purposes. All requirements related to the handling and use of pesticides, as set out in The Ontario Pesticides Act and the accompanying Regulation 751, are strictly adhered to. The following requirements of that legislation and regulation, and additional controls on the use of pesticides which are regular MNR procedure, are of particular importance:

- (i) Pesticides are transported in accordance with Sections 105-107 of Regulation 751; MNR encourages bulk shipments from the manufacturers on large spray projects to minimize the possibilities for spillage and exposure.
- (ii) Pesticides are stored in buildings or areas which have been specifically determined, in accordance with Sections 98 and 99 of Regulation 751.
- (iii) A licensed exterminator (i.e. licensed by MOE under the terms of The Ontario Pesticides Act) must be present at each location where mixing of pesticides is carried out.
- (iv) All application contractors and all spraycraft pilots are also licensed by MOE.

- (v) For each aerial spray project, a project description is prepared; all such project descriptions are reviewed by all MNR program group in the District.
- (vi) For each aerial spray project, an "Application to Perform an Extermination from an Airborne Machine" (MOE Form 5) must be submitted to MOE for formal approval prior to carrying out the operations, in accordance with Section 67 of Regulation 751 or as regular MNR procedures.
- (vii) For each aerial spray project, as regular MNR procedure, a security plan, a safety plan, an operations plan and a communications plan must be developed.
- (viii) All post-application cleaning and decontamination operations are conducted in accordance with Section 23(2) of The Ontario Pesticides Act and Section 25 of Regulation 751.

9.2 Provision of Access

Access to the timber resource is needed:

- (i) to transport personnel and equipment required to harvest, renew and maintain the timber resource; and
- (ii) to transport raw wood (logs, poles and chips) from the forest management unit to wood-processing facilities.

In Ontario, most access is provided by road because it is most cost-effective and provides the greatest degree of flexibility. Rail, water and aircraft are occasionally used, but to a limited extent, or to carry out only very specific functions. A description of each of these alternative methods for the provision of access is presented in the following discussion.

9.2.1 Roads

Roads are the most commonly used form of access to the timber resources on Crown lands in the province. More than 80 per cent of wood transport is by road, and personnel and equipment are almost

totally transported by road. There has been a shift to road use
from water and rail over the past 30 years - a trend that is very
likely to continue.

Access roads are constructed and maintained to various standards,
primarily recognizing the longevity and intensity of their use. The
roads used in timber management are classified as **primary**,
secondary and **tertiary roads**.

Primary roads are constructed, maintained and used as the main
all-weather road system providing access to the management unit as
a whole. They are used continuously and frequently, for the
transport of personnel and equipment to and within the management
unit for harvest operations and subsequent renewal *and maintenance*
activities, and for the transport of wood from the management unit
to the wood-processing facilities. They are essentially permanent
roads, regularly maintained, with an expected life in excess of 15
years.

Secondary roads are designed for use as all-weather access for a
period of five to 15 years. They are essentially branches off
primary roads, providing access to areas of operations within a
management unit. These roads are not considered permanent, and are
not normally maintained beyond the five to 15-year period of their
use.

Tertiary roads are built for short-term use (up to five years).
Usually, these roads provide access for an annual harvest, and any
subsequent renewal activities. These roads may be thinly surfaced
or unsurfaced, and are not maintained beyond the period of their
use; *often*, they are reforested.

9.2.2 Rail

Rail transport currently is used almost solely to transport wood
from management units to wood-processing facilities, and accounts

for approximately 15 per cent of total wood transportation.
Personnel and equipment are rarely transported to management units
by rail.

Railway lines may provide a permanent system of access to the
management unit as a whole, but unlike roads, they are not used to
gain access to the actual area of operations within the management
unit. Where rail access is used, it is always in conjunction with
road access; wood is invariably brought by roads to the rail siding
for transport to the wood-processing facilities.

No new railways are likely to be constructed in the future solely
for the purpose of timber management.

9.2.3 Water

As is the case for rail transport, waterways are used only for the
transport of wood from management units to wood-processing
facilities. The use of waterways associated with timber management
has slipped from its prominence of 50 years ago, when 80 per cent
of harvested wood was moved by water, to a present-day share of
five per cent of the total wood movements in the province.
Personnel and equipment are rarely, if ever, transported to or from
management units by water.

Waterways normally provide access only on a seasonal basis, since
lake access is limited by winter ice conditions, and rivers may
have low summer flows which limit their use.

As in the case of rail access, water is not used to gain access to
the areas of operations within the management unit. Where water
access is used, wood is brought by roads to the waterway for
transport to wood-processing facilities.

9.2.4 Air

Fixed-wing, helicopter or balloon aircraft are not used to transport wood in Ontario, nor are these methods likely to be used in future. Ontario has few insurmountable topographical features which would require aircraft for the transportation of wood.

Aircraft may be used to transport personnel on a daily commuter basis to remote operations where no supporting camp facilities exist. Since a road system is normally in place, and air transportation is normally much more expensive, personnel, equipment, and supplies normally do not move by air.

The one activity that commonly uses aircraft (fixed wing and helicopters) is that of maintenance, notably in the aerial application of herbicides for *site preparation and tending* purposes and insecticides for protection of the timber resource *from insect infestations*. To accommodate takeoff and landing within the management unit, airstrips are usually constructed by widening existing access roads.

9.3 Harvest

9.3.1 General

There are three broad alternative methods used to harvest timber in Ontario: clear cut, shelterwood cut, or selection cut. The choice of a particular method in a particular area will be determined by weighing a number of factors during timber management planning, including:

- objectives of management;
- the general conditions of the forest region;
- the site conditions (soil, topography, climate);
- the existing condition (age and quality) of the timber resource;

- the species of trees and the mix of species;
- concerns of other Crown land resource users; and
- economics.

The selection of a method of harvest usually includes a decision as to what method of renewal will be used. As is evident in the discussion which follows, each method of harvest provides options for only a narrow range of renewal methods. In fact, in most harvest methods, it is the type of renewal desired (or best suited to the species and site) that will determine the choice of harvest method. This systematic approach to timber management usually goes a step further, to the stage of maintenance (i.e. tending and protection). When all three activities of harvest, renewal and maintenance are considered together, one refers to the complete package as a "silvicultural system".

In Ontario, there are three silvicultural systems in use: the *clear cut system*, the *shelterwood system*, and the *selection system*. Before describing the harvest methods within each of these silvicultural systems, the three different logging systems used in Ontario are discussed.

- (i) In the **shortwood logging system**, eight or 16-foot logs are delivered to the roadside for transportation. The operations of felling, topping, limbing, skidding, and slashing to length are performed between the location of the stumps and the roadside loading of the wood. Approximately 15 per cent of the province's annual harvest is undertaken using this logging system.
- (ii) Seventy per cent of the province's annual harvest is carried out using a **tree length logging system**. The operations of felling, limbing, topping, and skidding are performed between the stump location and the roadside. Wood may then be loaded and hauled as tree lengths or further processed at the roadside into preferred lengths before hauling.

(iii) The **full tree logging system** supplies the full tree, including limbs and tops, to the roadside for further processing into tree lengths or shorter lengths. The operations of felling and skidding are performed between the stump location and the roadside. Topping and limbing can take place at the roadside and the wood hauled as tree lengths, or the wood may be slashed to preferred lengths and then hauled. Occasionally, no topping, limbing or slashing takes place; the wood is simply hauled as full trees. Approximately 15 per cent of Ontario's annual harvest is undertaken using this logging system.

After trees are cut, they must be moved from the stump location to roadside areas (landings) where they are usually concentrated into piles before loading on trucks. The trees may be physically dragged to the road (skidding) or picked up from the ground and moved (forwarding).

9.3.2 The Clear Cut Silvicultural System

The **clear cut silvicultural system** is the most common of the three silvicultural systems in use in the Boreal Forest Region. It involves the harvest of all or most of an area of forest in one operation. This technique provides the conditions necessary for the establishment and survival of new trees by means of natural or artificial regeneration. Clear cuts are used where the species to be regenerated can grow in the condition of full sunlight following clear cut, and where species will grow well in stands of even-aged trees. The major coniferous tree species of the Boreal Forest Region grow well in the exposed conditions created by clear cutting.

This system is less commonly used in the Great Lakes - St. Lawrence Forest Region, where fewer species require the high exposure to light created by clear cuts. Clear cuts are occasionally used in this forest region for the management of sugar maple. If the

existing stand is of poor quality, it may be removed in one cut.
Seedlings and saplings have already been established in the heavy
shade under the full canopy, and will grow rapidly in the full
sunlight which follows clear cutting.

Clear cuts can be of various shapes and sizes and can be
characterized as:

- open clear cuts;
- strip and block clear cuts;
- seed tree clear cuts; and
- partial clear cuts.

Open clear cuts are often the result of the progressive cutting of
several even-aged stands over a wide area. These cuts are most
often irregular in shape and broken by topography and
non-commercial or immature stands. *Clear cuts of this nature
require that the site be environmentally stable. For example, large
progressive clear cuts should not occur on lowland sites which are
susceptible to excessive rises in the water table.* Open clear cuts
may also be planned to fit around areas of value to other users of
the forest. This means that parts of stands will not be cut (or
will be cut in a modified manner) in order to protect certain
identified values, such as wildlife cover, fisheries, water
quality, bird nesting areas, fragile sites, tourism values and
cultural features.

Strip and block clear cuts involve cutting in strip or checkerboard
patterns that alternate between clear-cut portions and uncut
portions. After five to 10 years, when the clear cut portions have
suitably regenerated, operators return to the area to cut the uncut
portions.

Seed tree clear cuts are used only with species that will
regenerate well by natural seedfall, such as black and white
spruce. A seed tree clear cut involves removal of all trees over an

area with the exception of either individual seed trees or a series of seed tree patches.

Partial clear cuts occur when only certain commercially-desired species are removed from a mixed-wood stand. This may mean that the conifers are cut in patches from a stand, leaving the non-desired species (e.g., aspen, white birch, cedar and tamarack). Normally, cutting of this nature is confined to stands that contain at least 40 per cent commercial species. Stands containing a smaller component of commercially-desired species will probably not be worthwhile to harvest and are not cut.

The clear cut harvest system may involve any of the three logging systems in use in the province, the most common being the tree length system. Cutting may occur through use of chainsaws or mechanical fellers, and the trees or logs may be moved to landings by mechanical skidders or forwarders.

9.3.3 The Shelterwood Silvicultural System

The **shelterwood silvicultural system** is most commonly applied in yellow birch and white and red pine forests, or in even-aged sugar maple forests in the Great Lakes - St. Lawrence Forest Region. Approximately five per cent of Ontario's annual harvest is produced under this system of timber management.

The application of the shelterwood system may involve as many as three separate cuttings conducted in the following order:

- preparatory cuttings, which ready the site for regeneration;
- seed cuttings, which allow regeneration to become established; and
- removal cutting(s), which offer the young crop space and light for growth.

Natural regeneration requires that there be a seed source. Not all

stands are in a state that allows them to produce adequate amounts of seed for successful regeneration. Preparatory cuttings may remove some of the trees of poor commercial quality from the main stand. This first cut may also clear the understory of poor quality saplings and competitive shrubs. Only enough openings are needed to allow the seed trees to enlarge their crowns and receive adequate sunlight to stimulate seed production.

The seed cutting is the stage at which the major cutting takes place. The stand is opened to a point where natural regeneration will take place under the shelter of the seed trees. All trees that are unnecessary to the seeding or sheltering of the new seedlings are removed; these trees provide the timber which yields the revenue necessary for the operation. Natural regeneration in the shelterwood system is commonly augmented by planting or artificial seeding.

There are two forms of the shelterwood silvicultural system currently in use. The **uniform shelterwood system** involves the application of the cuttings over an entire stand or area. The shelter trees are uniformly dispersed over the cutting area as the seed source for natural regeneration. The **strip shelterwood system** includes the application of usually three or more cuttings, but in strips. It is likely that each strip would be no wider than twice the height of the crop trees. Over time, all strips would be cut and the regeneration would be cut in a series of even-aged strips spaced throughout the managed area.

The moderate intensity of the harvest, the relatively small size of the areas which are harvested, and the risk of logging damage to residual trees dictate the use of small machines and the extraction of the wood in tree lengths or as shortwood. *Harvest operations* may be restricted to the winter season in order to use snow cover to help protect seedlings and saplings from skidding damage. The most common logging system currently in use is the tree length system using chainsaws and a conventional skidder.

9.3.4 The Selection Silvicultural System

The **selection silvicultural system** is most commonly used in uneven-aged tolerant hardwood forests of the Great Lakes - St. Lawrence Forest Region. Approximately 10 per cent of Ontario's annual harvest is produced under the selection system of forest management.

Harvest operations in the selection system involve the selection of trees by marking and then removing them, either as individuals or in small groups, at regular intervals and repeated indefinitely. Intervals between cuts may be from 10 to 20 years. This type of harvest ensures the perpetual continuation of an uneven-aged forest.

The moderate intensity of the harvest, and the risk of logging damage to residual trees, dictate the use of relatively small equipment and the extraction of the wood in tree lengths or as shortwood. The most common logging system currently in use is the tree length system using chainsaws and a conventional skidder.

9.4 Renewal

Renewal of the timber resource may occur in one of three ways following *harvest*: (i) the area may be left to regenerate naturally; (ii) the area may receive a site preparation treatment to facilitate regeneration of certain species naturally; *or* (iii) the area may be regenerated by seeding or planting, with or without prior site preparation.

9.4.1 Site Preparation

If a harvested area does not provide a suitable environment for a seed or tree seedling to grow, the area may be prepared so that this environment is improved.

When a site is to be regenerated by seeding, the environment must be conducive to germination and root penetration. Moist sphagnum moss seedbeds usually do not require any preparation; these sites will support germination and growth as they are. On drier sites, site preparation will remove duff layers and expose a mineral soil seedbed to assist the germination and survival of new seedlings. A good seedbed provides enough moisture to soften the coat of a seed and allow germination, and then allows the developing root system to take up moisture through the complete growing season.

Most areas that are to be planted will undergo some form of site preparation. Site preparation achieves three purposes: (i) it aligns the debris left after *harvest operations*, which makes it easier for tree planters to walk and to identify planting spots; (ii) it reduces the presence of competing vegetation from the planting spots; and (iii) it removes the layer of organic matter from the mineral soil.

There are three different forms of site preparation in use: mechanical, chemical, and prescribed burning. While each has its particular value to certain sites and species, the mechanical method is the most commonly used.

Mechanical site preparation involves the use of tracked or wheeled machines to drag or push various attachments which are designed to expose mineral soil and reduce existing vegetation. These attachments include front-mounted blades and teeth, which may be used year-round, and rear-mounted drags consisting of barrels, pads, chains, ploughs and patch scarifiers, which are generally used during the frost-free period. Ninety per cent of the province's mechanical site preparation effort is in the Boreal Forest Region.

Some sites may support many species of shrubs and undesirable trees that, if left alone, will not allow desirable species to establish themselves. Mechanical site preparation alone is usually not

adequate to control the competition for sufficient time to allow the new regeneration to become established; normally, more vigorous site preparation techniques are required. These techniques include chemical site preparation and prescribed burning.

Chemical site preparation involves the application of herbicides to control other vegetation that would impair the establishment and survival of desired tree seedlings. *Herbicides may be applied by backpack sprayers, tractor-mounted sprayers, or by aircraft, either before, during, or immediately after the regeneration operation.* To date, this form of site preparation has not been common in Ontario.

Prescribed burning involves the controlled use of fire on a designated area. The objectives of the burn are to reduce vegetation and/or logging debris remaining after harvest, and to prepare a suitable site for natural or artificial regeneration. The use of prescribed burning is almost totally restricted to the clear cut silvicultural system in the Boreal Forest Region, where in the past it has accounted for approximately 10 per cent of the site preparation program. Mechanical site preparation may also be used as a follow-up treatment.

Prescribed burning requires care in planning and execution in order that the fire may be properly controlled. Burns will not be conducted if there is a risk of the fire expanding, or if there are not sufficient staff or equipment to maintain control. An alternative and more costly treatment, such as chemical or heavy mechanical site preparation, may have to be used if the burn cannot be conducted.

9.4.2 Regeneration

Regeneration of the forest occurs naturally, either from seeds, from root suckers (e.g. aspen), or as shoots (coppice) from stumps or damaged stems of trees. Seed may come from standing trees or the crowns of trees left on the ground following harvesting.

Alternatively, regeneration may occur artificially, by planting seeds or tree seedlings.

In certain forests, seedlings, saplings and young trees may already be present prior to harvest. Depending on the objectives of management, the species present and other conditions, the harvest method used in these situations may be chosen so that regeneration will develop from this already well-established source. This procedure is common in the management of sugar maple in the Great Lakes - St. Lawrence Forest Region.

The decision of whether to rely on natural or artificial regeneration is based on many factors, such as management objectives, nature and location of the area to be treated, availability of seed sources (either for natural or artificial regeneration), and availability of planting stock. The costs vary considerably, and generally are least for natural regeneration and greatest for artificial regeneration.

Approximately 40 per cent of the artificial regeneration in Ontario involves planting of tree seedlings, either by hand or by machine. The seedlings may be bareroot or container stock. The container stock, which is grown in a peat plug, usually takes less time to produce, is the smaller of the two types, and is used where competition is minor. Planting is the most expensive regeneration method. Approximately 90 per cent of Ontario's planting is undertaken by hand on areas that have been site prepared. All mechanized planters that currently exist are adapted to the planting of fields and do not work well in the wildland conditions of northern Ontario.

9.5 Maintenance

Maintenance operations include the activities of tending and protection from *insect and disease pests*. Maintenance operations are carried out to ensure the survival and development to maturity

of the established forest crop.

9.5.1 Tending

Tending refers to any operation carried out to improve growth or quality of a forest crop at any stage of its life. It may consist of cleaning, thinning or improvement treatments. The most common tending operation in Ontario's forests is the removal of undesirable vegetation by mechanical or chemical means. These operations are referred to as "cleaning".

Mechanical cleaning involves cutting unwanted trees or shrubs with axes, brush-hooks, powered saws or by girdling. Girdling involves cutting through the outer and inner bark layers into the sapwood of a tree, thereby killing the tree.

Herbicides are used to kill or reduce the growth of competing vegetation in order to improve the survival and growth of the crop species - usually conifers. In tending operations, herbicides may be applied from the ground, either by spraying or by tree injection. Tree injection involves the use of special saws and axes. Most commonly, however, herbicides are applied aurally.

Stand improvement is a tending activity which is normally practised in older stands. Stand improvement is usually restricted to thinning, or removing undesirable trees from a stand to encourage the growth and development of the remainder of the stand. Commercial thinnings are conducted when the trees that are removed are of saleable size and generate income that is greater than the cost of conducting the operation.

There has been experimental use of several other methods of tending the timber resource, but none of these have been used on a regular basis. These methods include: applying fertilizer by aircraft, hand, or machine; draining wet sites through excavation of ditches; and cultivating, or plowing, to remove competing vegetation.

9.5.2 Protection

The other component of maintenance involves the protection of the timber resource from insect and disease pests.

The intent of protection operations in timber management is to control forest insect and disease pests when they are out-competing desired tree species or in stages of high or epidemic populations. The use of insecticides is not intended to eliminate insect pests; rather, insecticide use provides control of insect populations to allow the desired tree species to remain alive. Forest insect pests usually persist as natural components of forest ecosystems, but after treatment they compete from a subordinate position.

Disease control is practised rarely, usually involving the cutting and burning or burying of infected trees. The hand application of fungicides to freshly cut stumps to reduce the incidence of a root disease in plantations is practised primarily in the Great Lakes - St. Lawrence Forest Region. **Insect control** is undertaken periodically and selectively, normally if an insect epidemic is threatening or if an insect infestation is expanding significantly.

Some insect and disease control may be achieved by reacting quickly to the normal deterioration of stands by salvaging damaged timber before natural processes take over. Windthrown stands should be harvested before boring insects reduce the wood quality, or before secondary fungus infections can become established.

9.6 Renewal and Maintenance For Different Silvicultural Systems

As discussed in PART ONE, Section 9.3, the three silvicultural systems used in Ontario provide a co-ordinated approach to the harvest, renewal and maintenance of the timber resource. Harvest methods for each system have been described in that section. This section elaborates on that discussion by describing the particular methods of renewal and maintenance which are applied with each

silvicultural system.

9.6.1 The Clear Cut Silvicultural System

The regeneration of open clear cuts may be by natural or artificial methods. Natural regeneration may be achieved from seeds or cones that are scattered about during harvest (e.g. jack pine) or from seed from nearby standing trees (e.g. black spruce), from coppice regeneration (e.g. trembling aspen, white birch), or from seedlings established prior to harvest (e.g. maple). Artificial regeneration occurs on approximately 60 per cent of all clear cuts, and is undertaken through seeding by aerial or ground techniques (e.g. jack pine), or by planting. To increase the probability of success in regeneration, normally some form of site preparation would be used prior to seeding or planting. This might mean mechanical or chemical site preparation, or it could be prescribed burning.

The other variations on the clear cut system are designed to maximize natural regeneration by leaving seed sources in the remaining strips, blocks, or individual trees. In these cases, some seeding or planting may also be used to augment the natural regeneration. In addition, seeding or planting may take place several years later, if the site has not yet regenerated sufficiently.

Tending may occur in the new forests following clear cutting and subsequent regeneration. Later on in the development of the forest, some stand improvement work may occur, normally in the form of thinning.

A variety of insect pests such as spruce budworm and jack pine budworm which affect forests of the Boreal Forest Region may be controlled by the use of insecticides. Infestations are unpredictable, and therefore are controlled periodically as conditions warrant.

9.6.2 The Shelterwood Silvicultural System

In the shelterwood silvicultural system, soil disturbance during harvest operations *often* is sufficient to ensure the successful germination and establishment of tree seedlings, thereby negating the requirement for site preparation. However, the successful establishment of a forest crop in this system may require some form of site preparation, particularly for those species most commonly managed under this system. Where the seedbed is not exposed sufficiently for the successful regeneration of the desired species, mechanical site preparation may be carried out. Light equipment is used to prepare the seedbed for natural regeneration from the standing seed source left during the initial harvest operation. Chemical site preparation may be carried out, usually following mechanical site preparation, in order to control the advance reproduction of undesirable competing vegetation or tree species. This technique is most commonly used in the regeneration of white pine.

Prescribed burning is not extensively used as a site preparation technique in the shelterwood silvicultural system. It may be carried out in the regeneration of white and red pine, often using several successive burns to achieve the desired control.

The shelterwood silvicultural system is essentially designed to provide the conditions necessary for natural regeneration through the simple regeneration of a seed source and cover; artificial regeneration is very rarely practised. Occasionally, natural means of regeneration are not totally successful. In such cases, artificial regeneration by seeding or planting may be required.

Some tending takes place under the shelterwood system. Removal of undesirable deciduous species is normally limited to manual methods. Herbicides can be used to control vegetation in conifer regeneration. Stand improvement operations are carried out in the shelterwood silvicultural system to remove unwanted trees that were

not taken during harvest operations or undesirable trees that suppress the desired crop trees during stand development.

Pruning is occasionally carried out, particularly to improve the production of knot-free lumber in white pine. Pruning requires the removal of unproductive branches to allow growth over knots and the production of clear wood in the lower part of the stem of the tree. This operation is highly labour-intensive and occurs only on high quality trees destined for large sawlog or veneer production.

A variety of insect pests such as sawflies, weevils and caterpillars which affect forests of the Great Lakes - St. Lawrence Forest Region may be controlled *by the use of* insecticides. Infestations are *unpredictable* and therefore are controlled *periodically* as conditions warrant.

9.6.3 The Selection Silvicultural System

Site preparation techniques are normally impractical and undesirable in forest stands harvested under the selection silvicultural system, since there are many trees of varied ages left after harvest. Site preparation is not normally required, and therefore, seldom used. If the group selection variation of the system is used, site preparation may be carried out but only with small tractors or skidders.

Renewal of the timber resource in the selection silvicultural system is generally accomplished entirely by natural means. The young seedlings and saplings exist in such numbers on the floor of the tolerant hardwood forests of the Great Lakes - St. Lawrence Forest Region that natural regeneration can be assured.

The only tending activity that occurs on a regular basis under the selection silvicultural system is that of stand improvement. Generally, stand improvement activities are conducted during the regular harvest of a stand that is managed under the selection

silvicultural system. In fact, improvement may be thought of as
part of the harvest activity. Trees that are considered to be
undesirable in the stand may be removed along with the crop trees,
and may even be sold as fuelwood, thus contributing to the revenue
of the harvest. Undesirable trees include those with defects, trees
of species that are not suited to the site or the selection
silvicultural system, and shrub species. Trees may be removed by
cutting or girdling; however, cutting is favoured.

A variety of insect pests such as sawflies, weevils and
caterpillars which affect forests of the Great Lakes - St. Lawrence
Forest Region may be controlled *by the use of* insecticides.
Infestations are *unpredictable*, and therefore are controlled
periodically as conditions warrant. In the selection silvicultural
system, pest control operations are carried out infrequently.

10. DESCRIPTION OF THE ENVIRONMENT AFFECTED

The undertaking is carried out on more than half of the land area of Ontario. This area is diverse in terms of its physical features, its forest cover, and its general flora and fauna.

MNR takes the position that, in a class environmental assessment, the description of the environment affected need not be detailed, but must identify, in a general way, those components of the environment which are likely to be affected by the undertaking.

A description of the environment affected in any particular forest management unit is a requirement of the timber management planning process, as described in PART TWO, Chapter 2. The first step in that planning process requires the assembly and analysis of background information for the management unit. The background information will include inventory information on natural resources such as soils, forest resources, mineral resources, fish and wildlife resources, and recreational resources, as well as existing land uses. That background information will be used in the timber management planning process in the determination of the actual effects of proposed timber management operations on the environment of the management unit.

Over time, as new Timber Management Plans are prepared for each management unit, a comprehensive and regularly-updated environmental data base will be assembled. When examined collectively, the data bases for individual management units represent a data base for the entire area of Crown lands of the province on which the undertaking takes place.

When considering the environment affected by the undertaking, it is essential to recognize that the undertaking involves management of a part of the environment itself - the timber resource. "Forest Regions of Canada"³ (Rowe, 1972) provides a description of the two forest regions of Ontario within which the undertaking is carried

out. Those regions are the **Boreal Forest Region** and the **Great Lakes - St. Lawrence Forest Region**. FIGURE 10.1-1 depicts the geographical extent of those forest regions in the province.

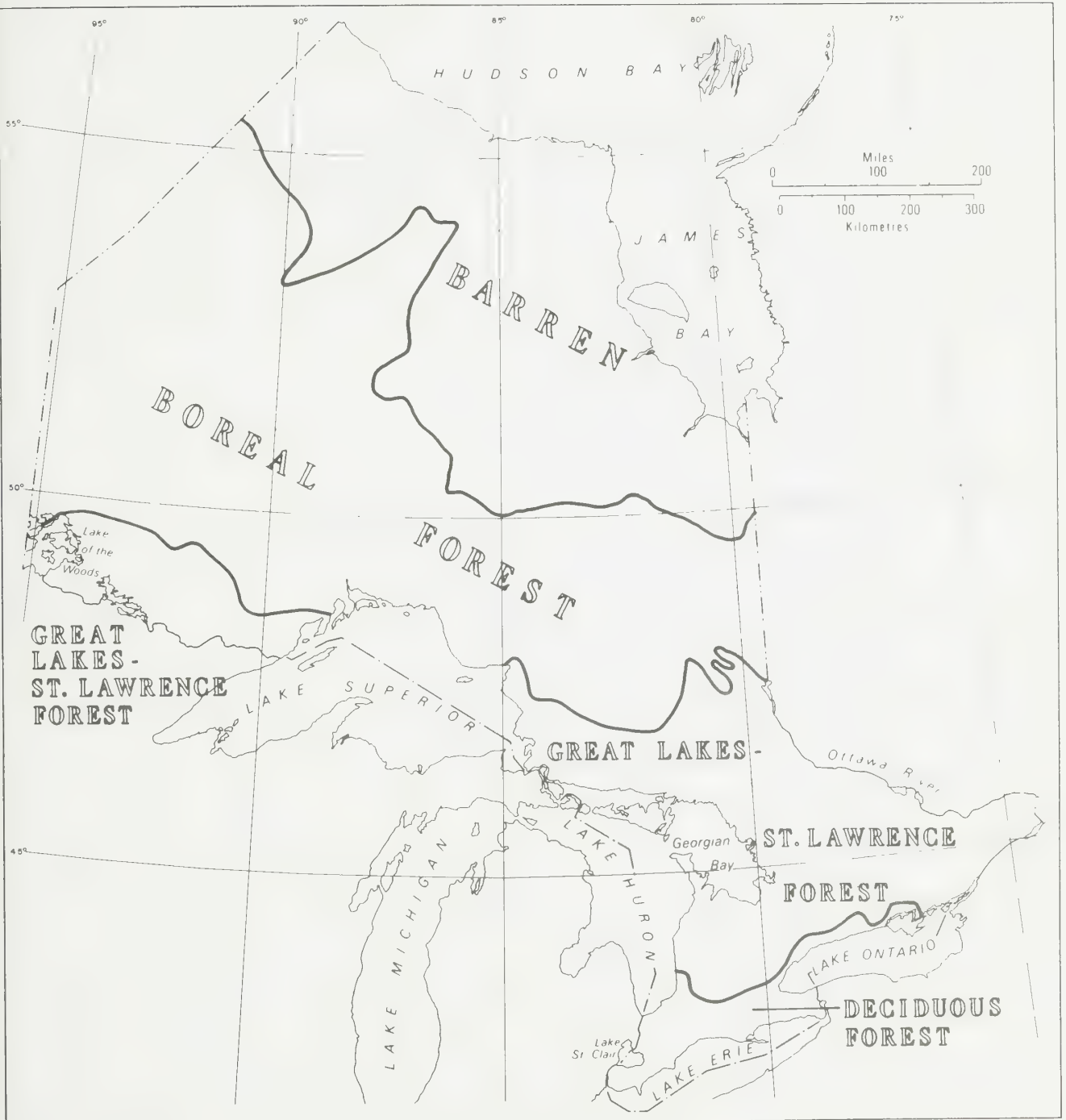
The **Boreal Forest Region** constitutes the greater part of the forested area of Northern Ontario. The Boreal Forest Region is primarily coniferous, with a general mixture of deciduous trees. The principal tree species are white and black spruce, balsam fir, jack pine, trembling aspen, and white birch. Minor species include tamarack, white cedar, red pine, white pine and black ash.

The Boreal Forest Region of Ontario is subdivided into a number of sections. The geographical limits of the sections are determined primarily by the identification of areas in which there is either a predominant tree species, or an identifiable group of tree species (commonly referred to as a "species association"). For example, the Missinaibi-Cabonga section is characterized by a forest which is mixed in character, consisting of an association of balsam fir, black spruce and white birch; and in the Central Plateau section, jack pine is the predominant species. The variation in tree species from one section to another is attributable to variations in factors such as surficial geology, soil type, climatic conditions, and drainage patterns. Within a section itself, tree composition can vary due to local drainage patterns and topographic features.

In the **Great Lakes - St. Lawrence Forest Region**, forest stands of a very mixed nature are characteristic. Conifers such as white and red pine, and hemlock, join hardwoods such as yellow birch, sugar maple, red maple, red oak, basswood and white elm as the principal species of the region. Other less common but wide -ranging species include white cedar, largetooth aspen, beech, white oak, butternut and white ash. Boreal species such as white and black spruce, balsam fir, jack pine, trembling aspen, balsam poplar and white birch also are intermixed throughout the region. This region is also subdivided into a number of sections, based on a consideration of factors similar to those considered for the Boreal Forest

FIGURE 10.1-1

The Forest Regions of Ontario



Region.

In addition to affecting that part of the physical environment comprised of the trees themselves, timber management affects other aspects of the terrestrial environment, such as soils, other vegetation and wildlife, as well as the aquatic environment. Because of the ubiquitous nature of timber management, the undertaking also has a substantial impact on the social, economic and cultural environment . It is difficult to divorce a description of these components of the environment from a discussion of the effects of the timber management activities on the environment. As a result, these components of the environment are addressed in the discussion of the environmental effects of the undertaking which is presented in PART ONE, Chapter 11.

11. POTENTIAL ENVIRONMENTAL EFFECTS OF THE UNDERTAKING

11.1 General

It is recognized that timber management operations may cause a variety of environmental effects. These effects may be positive or negative, short-term or long-term, direct or indirect, temporary or permanent, reversible or irreversible, or cumulative.

This chapter provides a description of the types and variety of potential environmental effects which may result from timber management operations across the range of forest and site conditions encountered on Crown lands in Ontario. The potential occurrence of any of the effects, their magnitude, and perhaps most importantly, the significance of the predicted effects, will vary between and within individual management units. This chapter will serve as the basic reference source for information on the potential environmental effects of alternative timber management operations when decisions among alternatives must be made during the preparation of Timber Management Plans for each management unit.

The timber management activities of constructing access roads and harvesting timber have the greatest potential to cause detrimental environmental effects. To a lesser extent, renewal and maintenance activities can also cause detrimental environmental effects. Renewal activities are, however, generally regarded as having considerable positive effects because they are undertaken to ensure re-establishment of the forest. *In general, timber management activities have considerable positive effects on the socio-economic environment, such as opportunities for direct and indirect employment, provision of wood and wood products to commercial markets, generation of revenues, and contribution to community stability.*

Most negative environmental effects can be prevented or minimized

through proper planning and implementation of timber management operations, or mitigated through application of effective remedial measures. Some residual negative effects will have to be accepted as the inevitable consequences of the timber management undertaking. As described in PART THREE, Chapter 1, there are a variety of manuals which *provide direction for* the implementation of timber management operations. These manuals describe actions which can be taken in varying situations to prevent, minimize or mitigate the effects of certain timber management activities on the environment.

The following sections describe the potential environmental effects of each of the alternative methods for the provision of access, harvest, renewal and maintenance. These effects are addressed under the headings of aquatic effects, terrestrial effects and social, economic and cultural effects. For harvest, renewal and maintenance operations, differences in the potential environmental effects for the clear cut, shelterwood and selection silvicultural systems are highlighted.

11.2 Provision of Access

11.2.1 General

As described in PART ONE, Section 9.2, most access is provided on land, primarily by road. Occasionally, rail or water access is also used, but solely for the purpose of transport of raw wood from management units to wood-processing facilities. Therefore, wherever rail or water access are used, it is in conjunction with a road access system. Air access is not used on an operational basis in Ontario, except for the specific activity of aerial application of pesticides for tending and protection purposes.

The construction of a road access system has the potential to result in significant permanent alterations to the environment in a management unit. The effects of roads on the aquatic and

terrestrial components of the environment and on other users of Crown land forests are frequently the major concerns with timber management operations. Where rail or water access are used as part of the access system, there are fewer concerns, primarily related to the effects on the aquatic environment and other users of those travelways.

11.2.2 Roads

Aquatic Effects

The soil surface in the undisturbed forest is covered with a litter layer which protects the soil. Road construction disturbs this protective layer through such activities as grubbing and grading. These activities expose mineral soil to the erosive forces of wind and water. In addition, road surfaces are highly compacted thus decreasing infiltration rates and increasing surface runoff. Runoff is concentrated in roadside ditches, further increasing the potential for erosion. For these reasons, roads can be a significant cause of accelerated erosion and subsequent sedimentation of contiguous lakes and streams.

Vegetative cover is a major factor influencing soil erosion. Vegetation both disperses and absorbs rainfall impact and stabilizes the soil with its roots. The extent of cutting and filling on slopes significantly affects the amount of vegetation and soil that is disturbed.

The occurrence of erosion from forest access roads is usually localized, being influenced by local topography and soil erodibility. Long, steep slopes are especially susceptible to erosion. The most erodible soils are those which are poorly drained and those with a high content of silt or fine sand.

The occurrence of erosion is also influenced by the frequency, intensity and duration of precipitation. The risk of erosion is

generally greatest during spring melt and during rainfall.

The extent to which sediment generated from roads reaches a watercourse depends on several factors, including proximity of the road to the watercourse, slope and vegetative cover. Slope has a major influence on the distance sediment travels from a road as does the occurrence of obstructions such as standing trees or shrubs.

Stream crossings generally pose the highest risk for sedimentation, both from disturbance of the streambanks and the stream channel during construction, and from subsequent erosion related to improper installation or maintenance of crossings. Alteration of the natural stream channel to facilitate crossing can result in erosion from bank cutting.

Culverts and bridges can result in sedimentation if improperly designed, installed or maintained. Culverts which are too short can lead to loss of fill material to the stream; those which are undersized or which become blocked by debris can result in washout. Bridges constructed by placing fill over logs or poles are also prone to loss of fill. Improper installation of culverts and bridges can modify flows so as to cause impoundment or scouring.

Erosion on disturbed soils, such as road cuts and fills, is greatest during the first year after construction. As revegetation and stabilization occur, erosion is reduced. However, continued loss of sediment can occur where soils remain unstable.

Since frozen soils are resistant to erosion, winter road use generally poses less risk of sedimentation. Sanding of road grades to improve traction can result in sedimentation of watercourses during spring melt.

Abandoned roads can be continuing sources of sediment unless preventive measures are taken. Blockage of culverts or ditches by

debris and sediment can lead to washouts and sedimentation. Ditches
and unstable slopes can be subject to erosion which may continue
for several years if bare soil is not adequately *stabilized*.

The deposition of sediment in watercourses can adversely affect
water quality in several ways. Sediments suspended in the water
column increase turbidity, the duration of which depends largely on
sediment particle size and local currents. The loss of water
clarity and associated colour changes can reduce aesthetic values
of a watercourse and limit recreational uses such as bathing, water
skiing and fishing.

Increased sediment loads can also adversely affect domestic,
industrial and agricultural uses of water. Costs of water treatment
can be increased and reservoir storage capacity is reduced.
Sediment can also damage mechanical equipment such as turbine
blades and pump impellers. However, the risk of such effects
occurring as a result of timber management operations on Crown land
is low since these operations are generally conducted at locations
remote from urban and agricultural areas.

Sedimentation alters aquatic ecosystems to a degree dependent on
the nature, quantity and duration of sediment inputs and the
sensitivity of local aquatic communities and their habitats. One of
its effects, increased turbidity, reduces light penetration thereby
reducing photosynthesis by algae and aquatic plants. Primary
production is therefore reduced, and less energy is available to
higher life forms in the food chain. Unless high turbidity levels
persist, however, this reduction is generally temporary and
production returns to normal.

High levels of suspended sediments can cause physical damage to
gill membranes of fish and to other organisms such as zooplankton.
The *significance* of such effects depends on the nature and levels
of the sediments as well as the duration of elevated levels. For
example, mortality of adult fish as a result of gill damage

generally occurs only after exposure of many days to levels of 200 to 300 milligrams/litre of suspended sediment.

Many fish species depend upon vision for feeding. Therefore, their feeding range can be reduced in turbid water. Likewise, angler success is reduced when turbidity is high.

The deposition of sediment on a stream or lake bed can significantly alter the composition of the benthic community. Accumulation of fine sediments in gravel areas can reduce the abundance of some species of aquatic insects, including species which provide food for fish.

Sedimentation can adversely affect fish reproduction. Many fish species require a clean substrate to spawn successfully. Even if spawning has been successful, later sedimentation may reduce survival of embryos by reducing levels of dissolved oxygen within the substrate, and may block the escape of emerging fry.

Bridges or culverts which have been improperly designed or installed may block the movement of aquatic organisms, including fish. The blockage of culverts by sediment or debris can also prevent fish migration. Undersized culverts can obstruct fish passage by increasing water velocity. Improper installation of culverts can also prevent upstream fish migration by creating too large a drop at the downstream end.

Wetlands are generally very sensitive to road construction. Road fills can act as barriers to the normal flow of water through wetland areas, resulting in impoundment of water on the upstream side of the road and lowering water levels downstream. Biological communities can be altered on both sides. Also, sediment can fill in wetland areas, destroying the habitats of plant and animal species. Recovery from such conditions is hindered by the lack of flushing action typical of such areas.

Waste materials generated by construction of forest access roads can both degrade water quality and affect aquatic life. Wastes such as slash and other organic material decompose slowly in water, resulting in biochemical oxygen demand and a possible lowering of dissolved oxygen levels. The latter can be reduced below levels necessary to maintain existing aquatic communities. Because of the high oxygen requirements of developing fish embryos, spawning areas are particularly sensitive to deposits of slash.

Oil, gasoline and pesticides which enter watercourses may lower water quality. These materials are potentially hazardous to aquatic life, depending on the inherent toxicity of the particular material and the opportunity for exposure. Some of these materials, or their degradation products, may also accumulate in the biota and may cause tainting of edible species. However, if care is taken in disposing of such materials, the risk of serious contamination is low.

A number of materials are used for the maintenance of forest access roads. Materials used for controlling dust include waste oils and calcium chloride. Dust control is not a common practice, but is normally employed in the vicinity of work camps.

The use of waste oils on forest access roads is very limited. Potential effects include contamination of watercourses, affecting taste, odour and appearance of receiving waters. Oil can also cause tainting of edible aquatic life. In addition, some waste oils may contain polychlorinated biphenyls (PCBs) which can accumulate in fish as a result of runoff from roads. Consumption of fish containing PCBs may pose a risk to human health. However, the PCB content of oils used for dust suppression is restricted by regulations under the Environmental Protection Act which are designed to avoid significant contamination of watercourses.

Herbicides are occasionally used to control growth of unwanted vegetation along forest access roads. Herbicides may enter

watercourses as a result of spills, accidental application, spray drift, surface runoff and leaching.

The toxicity of herbicides to aquatic organisms varies with the herbicide and its formulation, the species affected, water chemistry, turbidity and other factors.

Herbicides may also affect aquatic life indirectly. Indirect effects relate primarily to possible effects on aquatic plants. A loss of plants reduces the supply of oxygen to the watercourse. The removal of plants also reduces the availability of food for invertebrates, fish, and mammals such as moose and muskrats.

Use of herbicides may cause contamination of surface or ground water used for domestic purposes or for watering livestock. However, the risk of such effects is low since most forest access roads are located in lightly populated, non-agricultural areas.

Construction of forest access roads can provide public access to lakes and streams which were previously inaccessible by land. This often results in additional fishing pressure on these waters. The effect of increased fishing depends on the extent to which fishing pressure increases, the duration of the increase, and the capability of local fish populations to withstand increased fishing pressure. If fishing pressure is high and lake productivity low, fish populations may decline.

Terrestrial Effects

Road access systems may affect both game and non-game animal species. Effects may be direct or indirect.

The most significant direct effect of road construction on wildlife involves destruction of specific wildlife habitat features. Nesting sites, breeding areas, special feeding locations and winter shelter stands are examples of specific wildlife habitat features which may

be adversely affected by road access systems.

Non-game animals which have specific habitat requirements that may be destroyed by road access systems include caribou, sandhill cranes, and osprey. Areas of endangered species habitat and areas of particular value to wildlife may also be adversely affected.

The disturbance created by the construction or use of access roads can significantly disturb some nearby wildlife. Bald eagle nesting trees, for example, can be rendered unusable if forest harvest activities or road traffic are closer than approximately 800 metres during the breeding season.

Herbicides which are used to control unwanted vegetation along forest access roads may enter watercourses and wetlands as a result of spills, accidental application, spray drift, surface runoff and leaching. If a loss of aquatic vegetation or aquatic organisms occurs, moose and furbearers, which make use of these habitat features, may be adversely affected.

Erosion at road cuts or in ditches may occur with some loss of roadside vegetation. Most importantly, sediment inputs to watercourses and wetlands may be accelerated by road construction activities, generally resulting in subsequent localized effects on aquatic vegetation or organisms.

If roads are constructed across wetlands and insufficient allowance is made for the movement of surface and subsurface water, water levels may increase upstream of the barrier and may decrease downstream of the barrier. Biological communities, particularly flora, can be altered on both sides of the road.

Beaver frequently build dams at culvert entrances, resulting in flooding of wetlands, stream valleys or forests.

Road rights-of-way through heavily forested lands can benefit many

forms of wildlife in that a more diverse pattern of vegetation can result. The opening in the forest canopy allows the development of herbaceous plants and shrubs, thus providing protective cover and feed for a variety of birds and mammals. However, the presence of a road and traffic where none existed before will create a risk of animals being killed by vehicles. This risk varies with the population of animals, their movement patterns and the volume of traffic. This risk to animals is slight for most lightly travelled forest access roads.

A significant indirect effect involves opening previously inaccessible areas to hunting and viewing of wildlife. In some cases this increase in recreational opportunities will be considered beneficial. In other situations, over-exploitation of big game animals may occur. This increased exploitation is a function of both improved human access and the concentration of animals in the limited cover remaining after forest harvest. For example, if local populations of moose and deer are "suddenly" made accessible to hunters by a road system, they may be overhunted in the area made accessible.

Hunting is controlled by changing the hunting season length and timing, by limiting hunter numbers in wildlife management units, and by restricting the number and species of animals which can be killed. None of these control programs are currently specific to precise local areas, and therefore, the potential of excessive kill following the introduction of new road access systems will be present. Roads can also provide access to boat launching sites, thereby enabling hunters to go to areas they would not otherwise be able to reach, except by float plane. In some circumstances, improved access may be considered beneficial if a better distribution of hunting pressure occurs.

Other game species (e.g. grouse, snowshoe hare, woodcock and rabbit) are sufficiently prolific and widely dispersed that road access systems alone will not affect their population levels

FIGURE 3.2-1

Area of the Undertaking



seriously.

Social, Economic and Cultural Effects

The social, economic and cultural effects of access roads extend beyond the transportation of personnel, equipment and roundwood, and include tourism, recreational and other industrial uses.

One of the most significant values enunciated by the tourist industry, particularly in northern Ontario, is remoteness. While quality accommodation, fishing and hunting are extremely important, so too is the sense of isolation in an undisturbed forest area. The construction of access roads to lakes occupied by tourist operations is the single most important factor reducing remoteness.

Access roads for timber management purposes eliminate the rationale for, and the viability of, fly-in tourist operations, by providing an alternative form of access, which competes with that provided by the tourist operator.

Remote tourist establishments, particularly fly-in main base lodges, represent the investment of sizable amounts of private capital. Access roads for timber management purposes can result in significant devaluation of the market value of these operations.

Additional effects of access roads on the tourist industry may be reduced operating revenues, reduced marketability, increased fishing and hunting pressures, degraded fish and wildlife populations, declines in angler and hunter success rates and increased conflict with other user groups.

Access roads can provide increased tourism benefits for that sector of the industry which relies on readily accessible Crown lands and waters. However, for the remote tourist industry, the net effect of access roads would be reduced social and economic benefits.

Access roads can also create additional sport fishing and sport hunting opportunities, especially for local residents, and particularly where there is insufficient supply to meet current demand.

The amount of additional sport fishing and sport hunting provided depends on such factors as area of land, number of lakes and productivity of waters accessed, type of fish and wildlife communities and level of harvest. Heavy pressure may require intensive management if benefits are to be sustained.

Access roads can also affect other established land uses such as existing and candidate provincial parks. The use, function and theme of those parks may be affected by providing access to areas in close proximity. For example, new road access to areas close to a wilderness park may provide a means to gain access to previously-remote waterways, potentially affecting the wilderness quality of the park.

On the other hand, a road access system can establish the basis for future recreational development by providing access to areas for camping, cottaging and other outdoor recreational pursuits.

Access roads may also provide access to heritage resources which range from Indian rock paintings and sub-surface remains of prehistoric camps and villages to more recent historic structures such as mine buildings and marine railways. Such access may result in the disturbance or destruction of those resources, while on the other hand providing opportunities for research and interpretation.

Access roads can occasionally present opportunities for development which might not otherwise take place. Roads may be developed which provide better access to remote communities and native settlements, or which provide alternative access for land-locked communities.

Management of various provincial programs such as fire and pest

control may also be enhanced, and opportunities for mineral exploration may be expanded as access to remote areas increases. Similarly, new opportunities for commercial fishing, including the harvest of bait fish, may be created and the efficiency of trapping operations may be improved as new access road systems reduce costs.

The activities associated with the construction of access roads can have serious negative and irreversible effects on archaeological resources and historic sites. Archaeological resources and historic sites may be disturbed by the physical disturbance of soils along road alignments and by aggregate extraction from gravel pits.

Access roads and associated gravel pits will also result in the loss of productive forest land with the result that less land area will be available to meet future needs.

The social, economic and cultural effects of new access roads vary in duration according to the type of road involved. Primary roads provide long-term access to an area, in excess of 10 years. Conversely, tertiary roads provide temporary access, and are not maintained beyond the period of their use (i.e. one month to five years). However, access by tertiary roads may extend beyond the maintenance period, particularly in winter. The specific social and economic effects of any particular road will be dependent on the location of the road relative to the range of resource values in the area, its duration, and any use management controls which may be applied.

11.2.3 Rail

Aquatic Effects

Rail access systems are now uncommon in Ontario and new railway lines are unlikely to be built for timber management purposes. The effects of existing railways on the aquatic environment are

generally low.

At stream crossings, culverts which are improperly installed or maintained can prevent fish passage. Bark and other debris can be deposited at the railhead during the transfer of wood. Such debris could gain access to nearby watercourses. In slow-moving waters, decaying woody material can reduce dissolved oxygen levels and, under anaerobic conditions, can produce hydrogen sulphide. The latter can adversely affect *domestic* and recreational water use, and is toxic to fish. However, railheads are usually located well away from water to provide space for yarding of wood and for storage. Therefore, it is unlikely that significant amounts of debris would enter a watercourse.

Terrestrial Effects

Rail access systems may act as physical barriers to wildlife, inhibiting their movements or occasionally causing the death of animals. Ungulates sometimes use rail rights-of-way as winter travel corridors and spring/summer open space, thereby resulting in collisions with trains. Effects could be significant in a localized area. As well, noise disturbance of wildlife may be a concern.

Social, Economic and Cultural Effects

The function and use of railways is similar to that of roads in terms of transportation of wood, but due to their high cost of construction and maintenance, they are rarely considered as a primary means of access for timber management purposes.

Tourist operators dependent on values strongly associated with remoteness and wilderness generally view rail systems as more desirable than other access alternatives, particularly permanent road systems.

The use of railways for recreational, tourism and community access

purposes is limited, with generally insignificant effects on those activities. However, a few tourism operations do rely substantially upon train service, such as the Algoma Central Railway excursions from Sault Ste. Marie to the Agawa Canyon, the Ontario Northland Transportation Commission's Polar Bear Express excursions from Cochrane to Moosonee, and seasonal short-run passenger trains, such as the Budd Cars which run from Sudbury to White River.

11.2.4 Water

Aquatic Effects

Use of water access is now very limited in Ontario. However, where it is used, this method of access can have significant effects on the aquatic environment.

The construction of landings near the water's edge to facilitate log handling results in removal of vegetation and soil compaction. This may be accompanied by increased shoreline erosion and sedimentation.

Bark and other woody debris may be deposited in watercourses during the various phases of the transport operations. These phases include unloading of logs at the shore, storage, water transport, and, finally, removal of logs from the water. Such debris may degrade water quality by increasing levels of turbidity, suspended solids and phenols. In addition, the deposition of woody debris in watercourses exerts a biochemical oxygen demand and may result in reduced levels of dissolved oxygen.

Bark and related debris can smother aquatic plants and benthic invertebrates. Since bark decays slowly, such effects tend to persist. Woody debris can also prevent adequate provision of water and oxygen to fish eggs deposited in bottom sediments, thereby increasing egg mortality.

During storage or transport of wood, logs can become waterlogged
and sink to the bottom. Such logs can destroy benthic organisms and
cause compaction of bottom sediments.

Log driving can result in gouging of streambanks and stream bottoms
causing erosion, sedimentation, and the loss of fish habitat. Dams
are occasionally used to release water periodically to facilitate
log driving. This produces surges of water and logs, which increase
the potential for bottom and bank erosion. Such dams form an
obstruction to fish migration and their use can prevent fish from
spawning. Fish eggs and benthic organisms can be destroyed by
scouring and sedimentation.

Terrestrial Effects

Clearings created at the shore as log dumps can result in erosion
with subsequent sediment deposition in the adjacent waterbody.
Siltation in the littoral zone can destroy or reduce both aquatic
vegetation and organisms, thus adversely affecting wildlife
dependent upon them (e.g. mink, muskrat).

Social Economic and Cultural Effects

Wood is rarely transported by water in Ontario. However, where this
method is practised, water-oriented outdoor recreation and tourist
activities can be adversely affected.

Floating and submerged logs, for example, represent a serious
potential hazard for pilots attempting to land pontoon-equipped
aircraft and passengers at main base lodges, outpost camps and
Crown land sites. Similarly, floating and submerged logs can
represent serious potential hazards for boaters and swimmers.

Sport and commercial fishing quality also can be impaired as fish
populations are reduced as a result of degraded water quality,
sedimentation and the loss of habitat.

Where *harvest* operations coincide with fishing and hunting seasons, those operations, and the associated noise disturbance, can reduce the enjoyment derived from these forms of recreation. Wildlife populations can also be significantly displaced with possible serious implications for commercial tourist operators dependent on sport hunting.

The alteration of the age class structure of the forest may affect adjacent areas, potentially resulting in windthrow problems and blockage of recreational travel routes. Existing traplines may also be temporarily disrupted by harvest operations, especially through the loss of forest cover. Potential disturbance of unknown archaeological sites as a result of site damage may also occur.

Harvest operations may affect mineral exploration. Reference grids outlining the area of a claim are often marked by using standing trees, pickets or cut lines. These reference grids may not be known to timber operators and can be destroyed during harvest operations or rendered unrecognizable among the slash and debris left behind.

The direct economic benefits of harvest operations are the provision of wood for the market and the employment generated. Both of these have indirect and multiplier effects on the local, regional and provincial economy.

Per cubic metre of wood harvested, the clear cut silvicultural system is the most economical method of harvest operation, particularly in the Boreal Forest Region. The value of a cubic metre of pulpwood, the most common unit of measure in the Boreal Forest Region, is much less than that of a hardwood sawlog or a veneer log, more common products produced by the selection and shelterwood silvicultural systems in the Great Lakes-St. Lawrence Forest Region. It is essential that the relatively low per cubic metre cost of harvesting pulpwood be maintained as this can account for 30 per cent or more of the cost of a tonne of pulp, the primary product.

example, an area of 500 hectares, cut in strips in the first year, with "leave blocks" removed five years later, may be virtually the same as a large clear cut. However, if limits are put on how high the regeneration in the cut areas should be before the "leave block" is cut, the result of this type of harvest operation can be beneficial to wildlife.

The timing of harvest operations can be important to wildlife. For example, caribou migration may be inhibited or some birds may abandon their nests if disturbed by nearby harvest operations at certain times of the year. White-tailed deer can benefit from the browse supplied by winter cutting of hardwoods adjacent to yarding areas.

Social, Economic and Cultural Effects

The effects of harvest operations on tourism and outdoor recreation are primarily related to the loss of aesthetic appeal and site damage. In particular, in remote areas, existing tourist operations, or areas with identified tourism potential can be adversely affected when wilderness characteristic's are destroyed and/or the tourist's desire for a sense of isolation in undisturbed forests is not satisfied.

Remoteness has a number of ingredients including such elements as visual quality, isolation from other forms of development, difficult access and an exclusive type of use for the guest who finally arrives at the tourist operation. Canoeists, hikers and other visitors to the area may also find the aesthetic value of the scenery altered to such an extent that they too no longer find the area attractive.

Where substantial private capital investments have been made, tourist operators require protection from both the devaluation of their assets and the reduction in operating revenue which can result from harvest operations.

An indirect effect of large clear cuts on moose is their increased vulnerability to hunting. Although an improved food source for moose may regenerate in a few years after harvest of the forest, the lack of protective screening cover makes moose susceptible to hunting.

Smaller clear cuts with irregular edges, and which are not converted to pure conifer regeneration, are not seriously detrimental to most wildlife species.

The clear cut silvicultural system is not commonly used in the Great Lakes-St. Lawrence Forest Region. *If it should occur with cuts exceeding 130 hectares, it would have detrimental effects on wildlife species similar to those in boreal mixed-wood forests.* Smaller cuts (i.e. less than 50 hectares) often improve wildlife habitat in this forest type because they result in a greater diversity of plant communities.

The selection silvicultural system tends to favour maintenance of a closed canopy forest with primarily shade-tolerant tree species. It also favours animals adapted to mature forest types, since very little cutting occurs which allows establishment of early successional forest types. White-tailed deer do not favour this habitat type, although some species of birds and smaller mammals find their food and shelter requirements here. Eventually, this system will result in a mature forest with animals adapted to that forest (e.g. wood warblers, flying squirrels, red-shouldered hawks, deer mice). Harvest operations only *affect* the specific animals associated with certain trees or other habitat features. *Effects* on wildlife populations are usually very minimal.

The shelterwood silvicultural system results in even-aged stands, as does clear cutting, but the process of harvest operations is protracted so that a forest canopy of some form always exists in the area. Generally, this system tends to be good for wildlife and leaves good habitat quality. However, there may be exceptions. For

change from diverse pattern to monotypic growth. An extensive
 mature jack pine stand, for example, may not be good moose habitat
 prior to cutting. Clear cutting that stand would not significantly
 reduce the quality of that habitat for moose, although it may
 seriously *affect* local woodland caribou and spruce grouse
 populations.

The *effect* of clear cut harvest operations on wildlife populations
 depends on the kind of plant community present before harvest, and
 the size and shape of the clear cut. Boreal mixed-wood forests, for
 example, have at least 150 different species of breeding birds,
 making them one of the richest breeding habitats on the North
 American continent. They are also highly preferred habitat for
 moose and other northern wildlife. Extensive jack pine and black
 spruce stands, however, support relatively few, specialized
 wildlife species, such as spruce grouse and woodland caribou.
 Therefore, large clear cuts (i.e. greater than 130 hectares) which
 remove all standing timber from monotypic stands of jack pine or
 black spruce may not, in the long term, seriously affect the
 wildlife species which inhabit them. Large scale disturbance in
 such forest types are relatively common and the wildlife species
 have evolved to cope with them. If other mature stands are present
 within travelling distance of these stands, the animals will
 usually move to them.

Similar large clear cuts in mixed-wood forests, however, can be
 very detrimental to wildlife. Many wildlife species are adapted to
 diverse plant communities with good interspersed food and
 cover. Large clear cuts, and the associated forest management
 operations which follow, may produce conifer regeneration at a
 commercially acceptable level; but the original forest is altered
 from a diverse community of plants to a relatively monotypic stand
 of timber. When this change is produced, the value of the forest as
 wildlife habitat is seriously reduced. Wildlife populations are
 reduced in proportion to the magnitude of change in the forest
 type.

the erosive powers of increased streamflow, can contribute to a lower quality of furbearer habitat. Conversely, should the slight warming or enriching of a stream lead to increased fish production, fish-eating wildlife could benefit, providing their other habitat components (i.e. denning areas, nesting sites, escape cover, etc.) are adequate. In a similar way, but to a lesser extent, wetland wildlife can be potentially *affected* by nearby harvest operations that result in accelerated erosion and deposition of silt in low areas. The physical filtering effect and nutrient uptake of wetland vegetation will in many cases limit the primary effects to the periphery of the wetland.

The kind and degree of forest disturbance as well as the proximity of the disturbance to the watercourse or wetland will determine its *effect* on water -dependent wildlife. Large clear cuts will generally have a greater *effect* on water yields, nutrient inputs and stream temperatures than smaller clear cuts. *The shelterwood silvicultural system can be expected to have less effect on these factors, and the selection silvicultural system will have the least effect.*

The forwarding system used (e.g. conventional skidders, forwarders, horses) can have variable effects on erosion by destroying vegetative cover, compacting soil and forming runoff channels. Similarly, the erosion from log landings can result in sediment deposits in nearby streams or wetlands.

On upland sites, no matter which silvicultural system is used, if a mosaic of vegetation is produced, with a variety of species and age classes, wildlife populations in the long term and over a large area will not be seriously reduced, and may increase. Any silvicultural system which changes the forest pattern from a diverse plant community to monotypic stands containing primarily one species or age class will usually cause wildlife populations in the immediate area to decrease. This decrease will vary with the wildlife species, and will be in proportion to the magnitude of

good habitat for wildlife. Some animals react to the very specific conditions created by fire, while others exploit the general pattern or mosaic of vegetation. For example, sharp-tailed grouse of northern Ontario are particularly drawn to open and semi-open areas, such as those that have been recently burned over. Some birds (e.g. woodpeckers) take advantage of the snags often produced by fire. At the other end of the spectrum are generalists, such as white-tailed deer and moose, which use a variety of successional stages and use several different vegetation types.

Harvest operations may have significant *effects* on local wildlife populations present at the time of cutting. Wildlife numbers in the vicinity of the harvested area will be reduced immediately following harvest operations. Because they have evolved in the presence of disturbance, however, most wildlife populations can cope with the disturbance imposed by timber harvest, if the harvest operation maintains habitat diversity over a large area. In the short term, area sensitive species that favour a large expanse of undisturbed forest and those making use of old growth forest components (e.g. cavity nesting birds), will be most affected by harvest operations. *These effects* can be lessened if these habitat components are maintained in proximity to the cut area. As the regenerated forest ages and old growth features (e.g. snags) re-appear, wildlife utilizing such features will establish themselves.

Some wildlife species colonize and exploit the newly-cut areas, while others colonize the successional stages between cutting and maturity.

To the extent that *harvest operations alter* streamflow or productivity, some forms of wildlife can be affected. For example, wildlife who eat fish (e.g. mink, herons, etc.) can be adversely affected by the reduced fish populations stemming from the loss of bottom dwelling aquatic insects, or holding cover (pools, riffles, overhanging banks). Overly-enriched streams, silt-laden water, and

potential for deposition of logging debris in the watercourse and
can destroy streamside vegetation.

Log landings are potential sources of sediment to nearby
watercourses, since the original ground vegetation is largely
destroyed and soils may be highly compacted. The degree of soil
disturbance is dependent on the number and size of landings used in
a specific harvest operation. Landings are also potential sources
of bark and other debris. Landings are often adjacent to forest
access roads as simple widenings of the road. Provided they are not
located adjacent to watercourses, the potential for aquatic effects
is low.

Terrestrial Effects

The forests of the Boreal Forest Region have evolved through time
with various disturbances, primarily fire, insect defoliation and
wind storms. Wildlife species which exist in the boreal forest are
adapted to such periodic disturbances. Timber management operations
represent another form of disturbance which wildlife species are
well-equipped to survive, provided that those operations mimic
natural events as much as possible. Natural disturbances frequently
leave unaltered or marginally affected patches of vegetation for
wildlife food and shelter. As well, damaged organic material
remains on site to decompose and replenish the soils. When timber
management operations, including harvest operations, do not mimic
natural disturbance patterns, problems for wildlife can occur.

The forests of the Great Lakes-St. Lawrence Forest Region have also
had periodic disturbances imposed upon them for thousands of years.
Although not as extensive or pervasive, the disturbance factors are
similar to those of the more northern boreal forest (i.e. fire,
wind and insects). Wildlife in these forests have been able to cope
with these changes.

The conditions created by recurrent natural disturbances can create

The extent and significance of nutrient inputs from clear cutting are difficult to assess. Study results vary widely because of variation among study areas and experimental treatments. *Generally, low additional nutrient concentrations have been reported in streams following clear cutting.* Revegetation reduces both the magnitude and duration of nutrient losses. In a northwestern Ontario study, stream concentrations of most elements returned to near normal within two years following clear cutting.

Water yield and nutrient loss are affected minimally by selection cutting since the remaining trees and vegetation quickly take up surplus water and nutrients. Selection cutting has a smaller effect on water yield than does block clear cutting, even with the removal of the same number of trees. The effects of shelterwood cutting on water yield and nutrient loss are probably intermediate between the other two silvicultural systems.

Extraction of timber from harvest site to landing can contribute to accelerated erosion by destroying vegetative cover, compacting soil and forming runoff channels. With the use of conventional skidders, the same skid trail may be used repeatedly which tends to expose and compact the mineral soil, reducing infiltration rates and increasing the potential for erosion. Forwarders rarely use the same path more than once. Wetland areas are particularly susceptible to the formation of runoff channels. New skidder technology, including the use of wide tires, does reduce soil damage.

Revegetation of abandoned skid trails reduces the risk of erosion. Alternate freezing and thawing during winter and spring also loosens compacted soils.

The potential *effects* of harvest operations on the aquatic environment is largely determined by the proximity of watercourses. Skidding in or near watercourses greatly increases the risk of sedimentation from surface and bank erosion. It also increases the

obstructions to fish passage; conversely, for some species of fish, fallen trees and debris provide shelter. Under the selection silvicultural system, the use of smaller harvesting machines may result in less soil disturbance and vegetation damage near watercourses than under the clear cut silvicultural system.

Removal of timber near watercourses can affect the productivity of aquatic systems. *Most of the nutrients* available to stream ecosystems in forested areas *are* derived from leaves and other detritus provided by nearby trees. The detritus supplies food for invertebrates which in turn provide food for fish. Fish also consume terrestrial insects which fall into the stream from nearby vegetation. Removal of streamside vegetation during timber harvest thus removes a major source of food for some species of fish. As revegetation occurs, the food supply is replaced.

Trees and other vegetation near streams also lower water temperatures by shading. Removal of timber can result in higher summer temperatures and light levels, thus increasing stream productivity. These changes may enhance fish production and benefit recreational uses such as swimming. However, they can be detrimental to coldwater fish populations, particularly in streams where summer temperatures are already borderline. Removal of vegetation may also bring about a reduction in dissolved oxygen levels, since the solubility of oxygen decreases with increasing temperature.

Harvest operations can alter the nutrient balance of a watershed. Increased inputs of major ions such as calcium, magnesium, and potassium, as well as carbon, nitrates and phosphorus to streams can occur following deforestation. The addition of nutrients to a watercourse may enhance its biological productivity. In some cases, this may be beneficial. In other cases, it may lead to excessive growth of algae and result in reduced levels of dissolved oxygen. Fish species, such as lake trout, which require oligotrophic conditions, can also be affected adversely.

increase streamflow to a greater extent than smaller ones. The increase in water yield diminishes as revegetation takes place.

The loss of transpiration generally results in an elevation of the water table in the harvested area. As the area becomes revegetated, the effect is reduced.

The seasonal distribution of streamflows may also be affected by harvest operations. In general, harvest operations result in higher peak flows. Increased peak flows can cause scouring of bottom sediments and streambanks, resulting in increased turbidity. Extreme peak flows can result in flooding of downstream areas, posing a risk of additional erosion and structural damage. However, it is doubtful that normal clear cutting practices increase peak flows sufficiently to pose a significant risk of flooding downstream.

Scouring of bottom sediments results in dislodgement of benthic invertebrates and fish eggs. High flows can accelerate bank cutting and stream widening with resultant loss of fish habitat.

Removal of forest cover also generally increases low flows which may benefit fish and other aquatic organisms by providing more living space during the low flow seasons of late summer and mid-winter.

In general, the effects of harvest operations on water yield are greatest in the first year. As revegetation occurs, water yields return to normal although the process may take a number of years.

In areas away from watercourses, harvest operations have little direct effect on the aquatic environment. However, felling of trees into or near watercourses can damage streambanks and lead to erosion and sedimentation. Unless removed, trees felled into a watercourse can also have a damming effect, resulting in bank cutting and erosion. Fallen trees and debris can also form

Conversely, river drives and log booms represent historic activities which can result in some tourism benefits (i.e. sightseeing, photography, etc.).

11.2.5 Air

Few significant effects are known, although some disturbance of wildlife could occur if prolonged noise from aircraft should occur. In order to accommodate takeoff and landing, portions of access roads may be widened, thereby increasing some of the effects described in PART ONE, Section 11.2.2.

11.3 Harvest

Harvest operations have the greatest potential of all of the activities of timber management for incurring significant detrimental environmental effects.

The extent and magnitude of the potential environmental effects of the variety of alternative methods of implementing timber management will vary among the three silvicultural systems used in Ontario. The differences in the potential environmental effects for the three silvicultural systems are highlighted in the applicable sections.

Aquatic Effects

The removal of forest cover results in increased total water yield of the formerly forested area, and in certain instances, increased surface runoff, because of the loss of interception and evapotranspiration by the forest. The size of the increase in water yield is variable. In a study of harvesting effects in northwestern Ontario, water yields increased from 44 to over 300 per cent on a monthly basis in the first year after clear cutting. Increases in yield are positively related to the amount of reduction in forest cover. Hence for a given area, large clear cuts will generally

11.4 Renewal

11.4.1 Site Preparation

Aquatic Effects

Mechanical site preparation disturbs the *duff layer* and may expose *mineral soil* to facilitate regeneration. Therefore, it is a potential cause of erosion until such time as sufficient revegetation has occurred to stabilize the soil. *The potential for erosion depends on the extent to which mineral soil is exposed and the inherent erodibility of the soil.* The type of equipment used may also be a determining factor. Unless the equipment is directed straight downslope adjacent to watercourses, *the risk of* sedimentation is low. Mechanical site preparation of previously-compacted areas such as landings and skid trails facilitates revegetation and may reduce erosion potential.

Potential effects of herbicides on the aquatic environment were described in PART ONE, Section 11.2.2. *The effects of herbicides which are used in chemical site preparation are similar to those effects described for road right-of-way maintenance. However, the use of aerial spraying in chemical site preparation increases the potential of herbicides entering watercourses as a result of drift. Proper aerial application procedures, however, include precautions, such as the use of buffers, to prevent or minimize drift.*

Prescribed burning of vegetation and logging debris infrequently increases the risk of erosion because almost invariably some surface organic layers remain unburnt. Surface runoff may be increased on moderate and steep slopes, leading to potential stream channel scouring and sedimentation. The magnitude of such effects is variable but appears to be partly a function of the intensity of the fire. Very hot fires can result in greater exposure of mineral soil than more moderate fires. In general, the *effect* of such changes as a result of prescribed burning appears to be small.

Burning increases water yield and can result in washing of ash and nutrients into watercourses. A high intensity forest fire in northwestern Ontario resulted in loss of nitrogen, phosphorus and potassium, but not to an extent where receiving waters were affected adversely. Loss of nutrients from prescribed burning of moderate intensity is probably smaller.

Burning *may destroy* streamside vegetation, thereby removing shade and causing long-term increases in water temperature. Under some circumstances, temperatures *may* rise to levels lethal to coldwater fish species.

Effects of prescribed burning are reduced as re-vegetation of the area occurs. In northwestern Ontario, water yields returned to normal within three years of the occurrence of an intense wildfire.

*** PARAGRAPH DELETED ***

Terrestrial Effects

Site preparation can have negative *effects* on wildlife habitat. The new forest crop in the clear cut silvicultural system usually comprises conifer trees suitable for commercial exploitation, and the competing vegetation is the deciduous trees and shrubs which are important components of wildlife habitat. When site preparation is successful in reducing the number and variety of deciduous trees in favour of conifers, habitat quality is reduced for many wildlife species.

Mechanical site preparation is not particularly detrimental or beneficial to wildlife habitat. However, problems occur when the tracked vehicles run over and destroy patches of vegetation left standing after harvest operations.

The effects of chemical site preparation depend on the particular herbicides involved. Depending particularly upon the duration of

their effectiveness, herbicides which are used to control herbaceous and secondary growth may adversely affect such herbivores as moose, deer, and rabbits, by limiting the amount of browse available. The herbicides which are used in Ontario, according to their registration, are not toxic to wildlife.

Prescribed burning is the least harmful site preparation technique to wildlife habitat. Fires of moderate intensity are less likely to damage soil or create nutrient losses than very hot fires. Potentially, the washing of ash and nutrients resulting from fire into watercourses or wetlands can have negative effects on water-associated wildlife. However, fire is a normal part of the ecology of Ontario forests and its use in site preparation does not appear generally to be detrimental.

Social, Economic and Cultural Effects

Archaeological resources may be disturbed by the exposure of mineral soil during mechanical site preparation, depending on the site condition and type of equipment which is used.

The effects of site preparation on tourism and outdoor recreational activities are primarily confined to the period of operation. Activities such as shoreline picnicking and hiking can be unappealing during site preparation. Adjacent areas used for tourism and outdoor recreational purposes may also be affected by smoke, noise and the sight of equipment during operations.

Chemical site preparation renders a cutover unsuitable for certain outdoor recreational activities, such as berry picking during the growing season of application, but enhances it in subsequent growing seasons by favouring non-woody vegetation.

Prescribed burning may reduce the aesthetic appeal of a cutover for tourism and recreational uses until such time as regeneration becomes established. Conversely, an area subject to prescribed

burning may appear more natural and visually appealing than either
an area freshly harvested or mechanically site prepared.

In northern Ontario, under the clear cut silvicultural system,
mechanical site preparation costs are normally in the range of \$190
to \$280 per hectare, while (aerial) chemical site preparation costs
range from \$50 to \$190 per hectare, and prescribed burning costs
range from \$70 to \$180 per hectare. Site preparation costs in
southern Ontario, where the shelterwood and selection silvicultural
systems predominate, range from \$120 to \$340 per hectare for
mechanical treatment to \$220 to \$400 per hectare for (ground)
chemical site preparation.

11.4.2 Regeneration

Aquatic Effects

Regeneration has minimal adverse effects on the aquatic environment
since neither seeding nor planting has any impact. However,
artificial regeneration usually involves site preparation with its
attendant effects.

Regeneration of harvested areas reduces many of the potential
adverse effects of harvest operations relating to water yield,
erosion, nutrient loss, and stream temperature. The rate at which
such *effects* are reduced depends on the speed with which
re-vegetation occurs. Artificial regeneration may establish a
vegetative cover more rapidly than natural regeneration.

Terrestrial Effects

The managed forest that is re-established will not duplicate in its
entirety the forest that existed prior to harvest. As a result,
wildlife species and numbers will vary from pre-harvest status. A
continuum exists, and as vegetation changes, so will wildlife
species and numbers.

Artificial regeneration efforts, depending on the nature of the pre-harvest forest, can produce dramatic changes in forest cover and thus induce changes in the wildlife community. For example, the conversion of an uneven-aged mixed-wood stand to an even-aged predominantly coniferous stand with less vegetative diversity may be reflected in less diverse, less productive wildlife populations, but the extent of the stand and its surrounding forest are determining factors.

The size and configuration of planted or seeded areas, the success of these regeneration efforts, and the proximity of other diverse habitat components (e.g. openings, streams, other ages and species of trees, etc.), will moderate the effects of forest regeneration on wildlife.

Natural regeneration normally provides a greater variety of vegetation and habitat conditions resulting in better wildlife habitat quality. Whatever the nature of the newly regenerated forest, its species composition and structure will always change over time. This means that as a habitat its conditions will vary. Normally, greater species diversity occurs in the earlier years of stand development.

Social, Economic and Cultural Effects

Regeneration of cutover lands can restore the aesthetic appeal of an area for tourism and outdoor recreation. The extent to which this occurs, however, depends on the timing and success of regeneration, as well as on the type of forest which results.

Long delays before regeneration is initiated and successfully established can leave tourist operations vulnerable to, and unprotected from, undesired and unplanned access. Speedy and successful regeneration, on the other hand, can ensure that visual quality, as well as a sense of remoteness, are quickly re-established.

Many tourist operations are also dependent, either wholly or in part, on sport hunting for moose, deer and bear. These species often favour the early succession habitat provided by newly regenerated forest lands. Conversely, however, through regeneration efforts, poplar and birch forest stands, which are productive for wildlife and often ecologically diverse, may be converted into pine or spruce stands which generally have less diversity and lower wildlife productivity.

A direct economic *effect* of both natural and artificial regeneration is the provision of timber for future harvest. Employment opportunities in tree seed collection, nurseries (i.e. seedling production) and planting occur only with artificial regeneration.

The silvics of the tree species to be regenerated, and the harvest method used, are prime factors in determining which regeneration technique will be used. Natural regeneration techniques are the least costly. Aerial seeding is the most economical form of artificial regeneration, costing as little as \$8 to \$15 per hectare. Seeding during site preparation usually costs in the range of \$100 to \$165 per hectare. Seeding, however, is species and site specific, and can only be utilized on a portion of the areas to be regenerated. In 1982, approximately 50 per cent of the Crown lands treated using artificial regeneration involved seeding.

Planting is the most expensive regeneration technique. In northern Ontario, the planting of container stock generally costs in the range of \$250 to \$310 per hectare, while the planting of bareroot stock may cost in the range of \$255 to \$640 per hectare.

These costs, with the exception of seeding during site preparation, do not include the costs associated with site preparation activities which are conducted prior to the regeneration activity. They also do not take into consideration the probabilities of success, which are generally lower for seeding than planting.

11.5 Maintenance

Aquatic Effects

Manual and mechanical cleaning methods have minimal *effects* on the aquatic environment. Any surplus water or nutrients resulting from removing vegetation are quickly used by remaining trees.

Cleaning with herbicides is the most common tending method in the Boreal Forest Region. The ways in which herbicides can enter surface water or groundwater, and the results that may occur, were previously described in PART ONE, Section 11.2.2. Cleaning may be carried out by either ground or aerial application of herbicides. The potential for drift is greater with aerial spraying.

Chemical and biological agents are applied by aerial or ground application to reduce insect damage in commercial and high-value forests. *Insecticides enter watercourses primarily as a result of accidental application and spray drift.* The potential for accidental application is greatest when an area containing numerous small streams is sprayed from the air. Under such conditions, it may be difficult for the applicator to see such streams or to avoid spraying them. *In general, the potential for insecticides to reach watercourses as a result of drift is also greatest with aerial spraying.*

Chemical insecticides vary substantially in toxicity to aquatic life. Potential toxic effects include acute toxicity to zooplankton, fish and benthic invertebrates. Insecticides may also cause sublethal toxic effects. In Ontario, mature stands may be sprayed for up to ten years before they are harvested.

Use of biological control agents such as bacteria and viruses in insect pest control is becoming more common. The environmental effects of such agents are not fully documented. However, available evidence suggests that the effects, *if any*, are minor. The

biological activity of such agents is highly target-specific.

Residues of chemical insecticides *may* accumulate *to some extent* in aquatic biota. Bioaccumulation of organophosphate and carbamate materials, which are currently in use, generally occurs to a much lesser extent, *and for a shorter period of time*, than chlorinated hydrocarbons, which were formerly used.

Use of insecticides may cause contamination of surface water or groundwater used for domestic or agricultural purposes. The significance of such contamination depends upon the degree and kind of exposure of humans or animals to the insecticide, its toxicity, formulation, persistence, water chemistry and other factors.

Terrestrial Effects

Cleaning operations can affect wildlife, particularly through the use of herbicides to suppress deciduous trees and shrubs. *The herbicides presently used in timber management, when applied at approved rates, do not bioaccumulate to toxic levels in wildlife.* The low persistence of herbicides, the high tolerance of animals to them, and their rapid rate of excretion, prevent such problems.

The major effect of herbicides *on wildlife* is to alter habitat. The period of suppression of vegetation is variable, depending on the site and the *nature of the* chemical treatment. *The effects are also variable.* For example, regenerating (young) deciduous trees and shrubs are valuable browse species for herbivores, such as moose and deer. The suppression of such vegetation over a broad area for an extended period would lessen the suitability of the area *for herbivores, especially ungulates.* In other instances, coppice growth of deciduous tree species may be encouraged, thereby increasing browse production which benefits wildlife species such a deer.

As well, herbicide use may assist in re-introducing a wildlife

habitat component (e.g. conifer cover) that has been removed by timber harvest operations. Wildlife dependent upon conifer cover (e.g. moose, for wintering areas), or upon mixed-wood forests (e.g. various warblers) would benefit.

Chemical insect pest control can affect wildlife in indirect ways. All of the insecticides currently in use in Ontario are either biological in nature, organophosphates or carbamates. These materials do not become permanently stored in body fat, in marked contrast to the organochlorines, such as DDT. Mild exposure to organophosphates, carbamates and biologicals at infrequent intervals does not result in cumulative effects. If overexposure occurs, acute toxic reactions are observed. Once the individual has been removed from further exposure, recovery is usually rapid with no serious after-effects.

Insecticides vary in species specificity, and their use can result in a generally depressed insect abundance in the area sprayed. As the reproductive season for wildlife corresponds to peaks in some insect populations, the survival or growth of young birds and certain small mammals can be threatened by a temporary lack of food. This effect is mitigated somewhat by such factors as re-invasion by insects from surrounding unsprayed areas, movement of birds and mammals to unaffected areas, and the hatch of some insects after spraying.

Biological controls, which are more species-specific, allow wildlife to divert their feeding activities toward unaffected insects.

* TWO PARAGRAPHS DELETED *

Stand improvement, which involves the removal of undesirable trees, has potential adverse effects on wildlife. Trees with poor form that may be dead or dying, and that contain numerous cavities, are often valuable as denning, nesting, feeding and perching sites for

many forms of wildlife. However, this *condition* is not reached until the late stages of tree maturation, and the removal of small diameter trees to improve tree growth during a forest's regeneration phase should have *few* adverse *effects* on wildlife. It is more important to wildlife that some of these trees remain after harvest to provide an element of vegetative diversity.

Social, Economic and Cultural Effects

For specific maintenance operations, such as improvement operations involving selective tree removal or protection operations involving the application of fungicides to tree stumps, manual operations are often the only practical alternative, in spite of their high costs.

However, due to the large areas usually involved and the associated economics, tending and protection operations commonly involve the aerial application of pesticides. In northern Ontario, average costs are \$140 per hectare for manual tending, \$50 per hectare for aerial application of herbicides and \$140 per hectare for ground application of herbicides. In southern Ontario, where tending activities are somewhat different, average costs are \$80 per hectare for manual tending, \$150 per hectare for ground application of herbicides, \$70 per hectare for mechanical tending, \$130 per hectare for improvement operations (i.e. thinning), and \$80 per hectare for pruning.

*** PARAGRAPH DELETED ***

Stand improvement work is a high-cost, manual tending treatment. It is used primarily in conjunction with the selection and shelterwood silvicultural systems, where high-value crop trees such as hardwood veneer and sawlogs are being produced. The high value of the raw product justifies the use of this expensive tending treatment.

In some instances, however, the same high value crop trees which are important to the forest industry may also provide important

scenic benefits to the tourist industry. Similarly, the removal of undesirable species, such as aspen and birch, may reduce species diversification and affect the quality of the forest from a tourism or aesthetic point of view.

*** PARAGRAPH DELETED ***

The use of herbicides and insecticides/fungicides for tending and protection purposes may create concern for possible health effects among local residents and recreationists. The degree of human exposure depends greatly on human use of the area, the scale and method of pesticide application, and the extent to which agricultural products and natural crops such as berries are exposed to the chemicals.

The use of pesticides can reduce the appeal of the treated lands for recreational use for the remainder of the growing season in which they are applied. The local tourist industry may be adversely affected for this period of time. Conversely, the use of pesticides may significantly preserve tourism and outdoor recreational values by maintaining forest cover and scenic qualities which might otherwise be damaged or destroyed by insect/disease pests.

The application of pesticides and the maintenance of healthy forest cover can also significantly lessen the hazard for forest fires and the potential destruction of tourist lodges, outpost camps and ancillary structures.



PART TWO

THE TIMBER MANAGEMENT

PLANNING PROCESS

PART TWO: THE TIMBER MANAGEMENT PLANNING PROCESS

1. INTRODUCTION

1.1 General

All of the activities which comprise the undertaking of timber management on Crown lands are addressed in Timber Management Plans. These plans are prepared for each *forest* management unit in the province. The Timber Management Plan is the controlling document for the implementation of the undertaking within each management unit. As discussed in PART ONE, Chapter 5, it is MNR's position that through the application of a common planning process which addresses *the environmental effects of timber management activities* and the interests of other users of Crown land forests, the purpose of The Environmental Assessment Act *as it relates to the undertaking of timber management* will be attained. PART TWO, Chapter 2 provides a detailed explanation of the planning process which is applied in the preparation of a Timber Management Plan.

A Timber Management Plan provides direction for all timber management activities within a management unit, based primarily on information which pertains to the individual management unit. In the timber management planning process, however, direction is also provided by objectives and policies derived from higher levels of government planning and decision-making.

The objective of MNR's Forest Resources Program on Crown lands in Ontario can be stated as: to provide for an optimum continuous contribution to the economy by forest-based industries, and to provide for other uses of the forest, through environmentally sound timber management practices. Within the framework of this objective, the management objectives for an individual management unit are formulated in a Timber Management Plan.

Three policies have been formulated to provide direction for the

achievement of MNR's provincial Forest Resources Program objective. 1

These policies are: 2

- (i) Sustained Yield Management, 3
- (ii) Forest Production Policy, and 4
- (iii) Integrated Resource Management Policy. 5

While the objectives and policies arrived at through higher levels 6
of planning in MNR provide general direction to timber management, 7
the key decisions of "if", "where", "when" and "how" timber 8
management will take place are made in individual Timber Management 9
Plans. Since these decisions are made at the management planning 10
level, the preparation of those Timber Management Plans has been 11
made the subject of this environmental assessment. 12

1.2 Sustained Yield Management 13

In the Crown Timber Act, sustained yield is defined as: 14

"the growth of timber that a forest can produce and that can be 15
cut to achieve a continuous approximate balance between growth of 16
timber and timber cut." 17

The literal meaning of the definition originates from the concept 18
of a "normal forest". Such a forest has an even distribution of 19
equally productive areas in all age classes up to the age of the 20
planned harvest (i.e. the rotation age). In the conceptualized 21
"normal forest", forest stands which have achieved rotation age 22
contain a volume of wood fibre which is approximately equal to the 23
volume of wood fibre that is being added to the forest by the 24
growth of all trees of all ages. If all of the trees at rotation 25
age were harvested and the harvest area was regenerated 26
immediately, a "continuous approximate balance between the growth 27
of timber and timber cut" would be achieved. 28

A "normal forest", which would be almost invariably man-made, would 29

have certain advantages, such as:

- the most effective use of forest land for timber production;
- a continuous and equal annual yield of wood products; and
- the flexibility to adjust the forest structure within a rotation.

However, the concept of a "normal forest" assumes certain conditions which in reality are impossible to attain. These assumptions are:

- each unit of land is equally productive;
- there is a relatively even mix of age classes;
- the growth rate in each age class is identical;
- there is no cause of depletion other than harvest;
- exactly 100 percent of the trees at rotation age are harvested;
- there will be 100 percent regeneration success;
- the area under management remains constant; and
- the rotation age remains constant.

In Ontario's forests, where such conditions never exist, the practical meaning of sustained yield is continuity of harvest. This practical meaning of sustained yield is explained in the textbook, "Forest Management: Regulation and Valuation"⁴ (Davis, 1966) in the following manner:

"Whether reckoned by years or by longer periods, the purpose is to obtain a sustained flow of products, a flow that may be currently increased or diminished in accordance with the purposes of management and the condition of the forest, but which may be continued indefinitely even though often at variable levels."

Timber management is aimed at organization of the forest to bring about this sustained yield of wood products in an efficient and orderly manner. In order to apply the principle of sustained yield to timber management, the manager must consider two time horizons:

- (i) the short-term horizon of the timber management planning period, which is typically 20 years; and
- (ii) the long-term horizon of the forest rotation, which is typically 80 to 100 years, or longer.

The most important application of the sustained yield principle in timber management planning is the establishment of a management objective which ensures that a flow of wood products from the management unit is realized for a period of time. The actual yield may fluctuate from year to year; however, an amount should flow year after year for the length of that time period. This objective is quantifiable, if one specifies the desired (and attainable) volumetric level to be realized and the planning period over which it will be attained. Success in achieving this objective is measured by comparing the planned and actual yields over time.

A second application of the sustained yield principle in timber management planning is to aim for a forest structure beyond the planning period (i.e. for a forest rotation or longer) which is flexible enough to ensure similar yields in the future. The forest structure which is desired in the long term is that of a "normal forest" comprised of a relatively even mix of age classes, based on current assumptions of area, depletion rates, regeneration success and growth rates, fully recognizing that those assumptions will change over time and the estimate frequently must be revised. Movement towards a "normal forest" is measured by comparing the calculated "Maximum Allowable Depletion" (Refer to PART TWO, Section 2.1.1 for a description of this concept) for the actual forest with that of a "normal forest" over time.

1.3. Forest Production Policy

The formulation of the Forest Production Policy (FPP) originated from the need to quantify the provincial objective of MNR's Forest Resources Program, and the need for a continuity of government investment to achieve and maintain that quantified objective. Specifically, that part of the provincial objective statement which addresses "an optimum continuous contribution to the economy of Ontario by forest-based industries" requires quantification of a level of continuous timber supply (i.e. sustained yield), the time period in which to achieve the objective, and the necessary investment for activities such as provision of access, renewal and maintenance.

In 1972, MNR presented five options to the Ontario Cabinet, each option describing the level of sustained yield to be achieved, the forest land base required, the area to be regenerated each year, and the funding required to carry out the timber management and support activities. The Ontario Cabinet approved in principle an option which established the level of sustained yield at 25.8 million cubic metres (9.1 million cunits) of wood to be produced annually by the year 2020. Although this approval did not guarantee a level of government investment in staffing and funding to MNR, funds have been made available annually since 1972.

MNR has established and maintains an Implementation Schedule for the Forest Production Policy which details how much renewal and maintenance must take place each year in order to achieve the 2020 target of a sustained annual supply of 25.8 million cubic metres of wood. The Implementation Schedule specifies the major activities (e.g. site preparation, planting and tending) required to meet that provincial target, and assigns the required amount of each activity to each MNR Region.

It should be noted that neither the Forest Production Policy nor its Implementation Schedule specifies the requirements for renewal

and maintenance for individual forest management units. Those requirements are determined in the preparation of Timber Management Plans.

The practical application of the Forest Production Policy in timber management planning is the use of its associated Implementation Schedule. The schedule is used as a benchmark in reviewing, at the regional and provincial level, the aggregate renewal and maintenance activities which are planned in Timber Management Plans for all management units.

The requirements for access, renewal and maintenance, as described in the Timber Management Plan for each management unit, are the basis for the annual MNR District, Region and provincial Forest Resources Program funding requirements. The Implementation Schedule is used as a determining factor during the allocation of funds.

Finally, the Implementation Schedule provides a means of monitoring achievements at the Regional and provincial level, by allowing a comparison to be made between the amount of renewal and maintenance activity planned and the amount actually achieved. This comparison, over time, assists in directing renewal and maintenance efforts towards the provincial target set out in the Forest Production Policy.

(NOTE: MNR recognizes the need to review the Forest Production Policy of 1972. In MNR's Action Plan which responds to Dean Baskerville's 1986 report on the management of the Crown forests of Ontario (Refer to PART THREE, Section 2.2.1 and APPENDIX VII), MNR has made a commitment to develop a new Forest Production Policy by October, 1988.)

1.4 Integrated Resources Management Policy

Integrated Resource Management (IRM) is defined by MNR as:

"the coordination of resource management programs and activities so that long-term benefits are optimized and conflicts between programs are minimized."

MNR's mandate to manage lands, waters and resources in Ontario includes, in addition to the Forest Resources Program, the Lands and Waters Program and the Outdoor Recreation Program (Parks, Fisheries and Wildlife). Each of these programs has its own separate and distinctive objectives and benefits. To manage the area of the province for optimum long-term benefits, coordination in the planning and implementation of those various programs at all levels of the MNR organization is a prerequisite.

The Integrated Resource Management policy directs staff at all levels of the MNR organization to contribute actively to program coordination. The IRM policy originated from the concept of "multiple use", whereby different resource users with different objectives use the same resource base, either at the same time or sequentially, for optimum benefits. The IRM policy also directs MNR staff to continually strive to maintain open and effective communication within the ministry, and with other government ministries/agencies, interest groups and the public. This direction requires the consideration of the objectives and interests of those other parties during the preparation of MNR plans and policies.

To gain an understanding of the interrelationships between resource users and program interests and their effect on the resource base, and to evaluate the application of the "multiple use" concept to resource management, MNR initiated a land use planning program during the 1970s. The end-result of this program was the production of Strategic Land Use Plans for MNR's three planning regions in the province in 1982, and District Land Use Guidelines for most of MNR's administrative Districts in 1983 (Refer to FIGURE 1.4-1).

FIGURE 1.4-1

**Ministry of Natural Resources
Planning Regions, Administrative Regions
and Administrative Districts**



The regional Strategic Land Use Plans state the policies and objectives of individual MNR programs and integrate them into comprehensive regional land use plans. Those plans identified conflicting demands on natural resources, and are intended to assist in their resolution. At the same time, these regional documents provided the overall strategy within which the District Land Use Guidelines were formulated.

The District Land Use Guidelines identify the appropriate land and water areas within each District where various MNR programs may be carried out over the long term, and management guidelines for land use activities within these areas. In certain areas of a District, an area might have been identified for an exclusive use, such as a provincial park. Other areas may have been identified as having a priority use for a program other than timber management. In such cases, the particular program interest was noted as having priority in the District Land Use Guidelines. The overlapping interests of other programs must be dealt with during the next level of planning (i.e. resource management planning). Therefore, the interests of the Forest Resources Program are addressed through comprehensive planning requirements during timber management planning.

In timber management planning, the practical application of the Integrated Resource Management policy and the various management guidelines contained in the District Land Use Guidelines is through the timber management planning process which is described in detail in PART TWO, Chapter 2.

1.5 Exclusions

Prior to commencing the timber management planning process described in PART TWO, Chapter 2, the land area of the forest management unit which will be the subject of a Timber Management Plan must be established. Certain lands within each management unit will not be available for timber management, because of present or future exclusive use for some other activity, or

because those lands are outside of MNR's jurisdiction because of
ownership. These lands are identified as "exclusions" from the
land area of the management unit for which a Timber Management Plan
will be prepared.

Exclusions are comprised of:

- all patented (privately-owned) land;
- all lands owned and administered by the Federal
Government, such as Indian Reserves, Department of
National Defence Bases and National Parks;
- most provincial parks and approved provincial park
candidates; and
- all Crown land leases, licenses of occupation, land use
permits, quarry permits, etc.

For Forest Management Agreement Forests (FMAs), all exclusions are
legally described and excluded from the land area which is the
subject of the Forest Management Agreement.

The identification and geographical delineation of exclusions more
specifically establishes the land area within each management unit
on which timber management operations could occur, and for which a
Timber Management Plan is prepared.

2. THE TIMBER MANAGEMENT PLANNING PROCESS

2.1 The Timber Management Plan

2.1.1 General

PART ONE, Chapter 9 describes alternative methods of carrying out timber management activities. The potential environmental effects of those activities are described in PART ONE, Chapter 11. PART THREE, Chapter 1 discusses MNR's implementation manuals which have been developed to provide direction for the implementation of operations in response to those potential environmental effects. This chapter describes the planning process which will ensure that the potential environmental effects of operations are identified during the planning of operations, and that operations are ultimately carried out in a manner which prevents, minimizes or mitigates adverse environmental effects.

As described briefly in PART ONE, Chapter 4, timber management operations on a forest management unit can only proceed after the preparation and approval of a Timber Management Plan. A Timber Management Plan must be prepared for each management unit every five years. The plan is prepared for a 20-year period, and provides long-term direction for the management of the timber resource of the management unit, and outlines the details of operations to be undertaken during the initial five-year term. At the end of that five-year term, a new plan is prepared for the next 20-year period (i.e. the remaining 15 years of the original 20-year period, plus an additional five years). The new plan again provides long-term management direction for the management unit, and outlines the details of operations to be undertaken during the next five-year term.

This process is repeated at five-year intervals, thereby ensuring that detailed planning of operations for each five-year term is always undertaken within the context of an updated, long-term

management direction. The long-term direction provides for continuity of management, while the regular five-year update of that long-term direction provides the opportunity to assess past performance and the flexibility to accommodate changes in circumstances.

The timber management planning process is comprised of two components:

- (i) plan production, and
- (ii) plan review and approval.

As described in PART ONE, Section 3.3 three types of management units are recognized in Ontario: Crown Management Units, Company Management Units and Forest Management Agreement Forests (FMAs). Timber Management Plans are prepared by MNR for Crown Management Units, by individual forest companies in conjunction with MNR for Company Management Units, and by individual forest companies for Forest Management Agreement Forests (FMAs). All plans must be reviewed and approved by MNR's senior management prior to the implementation of operations. Opportunities for the participation of other government ministries/agencies and interested organizations and individuals in the production of the Timber Management Plan, and the review and approval process, are provided each time a new plan is prepared for a management unit.

Implementation of the planning process is undertaken/co-ordinated through MNR's District offices, with District Managers responsible for ensuring compliance with the requirements of the process in the production of all Timber Management Plans. For company-prepared plans, the District Manager is responsible for ensuring a close liaison between MNR and company staff in plan preparation.

At the outset of the planning process, the District Manager appoints a multi-disciplinary team of MNR District staff to participate in the preparation of the plan. That team represents

various programs including Forest Resources, Fish and Wildlife, Parks, Lands and Waters, and Fire Management. For Crown Management Units, the MNR Management Unit Forester is delegated responsibility for the preparation of the plan and normally acts as the co-ordinator of the planning team. For Company Management Units and Forest Management Agreement Forests (FMAs), the MNR planning team, normally co-ordinated by an MNR Forester, provides assistance to the forest company which is responsible for preparation of the plan.

Members of the MNR planning team and forest company staff initially familiarize themselves with the forest management unit and the requirements of the timber management planning process. Terms of reference for the planning team are established, outlining the roles and responsibilities of individual team members. In simple terms, the individual team members are responsible for ensuring that information from their respective program groups is contributed at the appropriate stages of the planning process, and that concerns of their respective programs are addressed. In addition, the District Manager may also assign specific responsibilities to individual team members to ensure that contributions from, and concerns of, interested external participants in the planning process are considered.

A specific schedule for the production, review and approval of the Timber Management Plan is then produced, in conformity with the requirements of the generic schedule outlined in FIGURE 2.1-2 (Refer to PART TWO, Section 2.1.3). For MNR-prepared plans, the schedule is produced by the MNR planning team. For company-prepared plans, the schedule is produced by the particular forest company involved, assisted by the MNR planning team. Upon establishment of the schedule, a public notice is issued, announcing commencement of the preparation of the Timber Management Plan for the management unit, and inviting all interested external participants to become involved in its preparation (Refer to PART TWO, Section 2.1.3).

The technical description of the plan production component of the timber management planning process is presented in PART TWO, Section 2.1.2. The description of the opportunities for public consultation in the preparation of a Timber Management Plan, and the description of the plan review and approval component of the planning process, are presented in PART TWO, Section 2.1.3.

2.1.2 The Timber Management Planning Process - Plan Production

The planning process which will be applied in the production of the Timber Management Plan is outlined in FIGURE 2.1-1, and is described in detail in this section. The process incorporates the key elements of any planning process, such as data collection and analysis, establishment of objectives, consideration of options, and rationalization of decisions. MNR's "Timber Management Planning Manual for Crown Lands in Ontario"¹ outlines the format for documentation of a Timber Management Plan, which is the product of the planning process, and provides technical direction to MNR and forest company personnel responsible for the production of Timber Management Plans.

In practice, timber management planning, like most planning processes, may not take the simple direct linear form illustrated in FIGURE 2.1-1, or prove to be a regular progression through neatly-defined stages as described in the following discussion. There will be constant feedback during planning in order that earlier decisions may be re-evaluated in light of later findings. The interrelated nature of the steps in the planning process requires that no one step can be dealt with independently; rather, the entire sequence of steps must normally be treated as a package.

STEP ONE: ASSEMBLY AND ANALYSIS OF BACKGROUND INFORMATION

INTRODUCTION

The planning team commences the preparation of the Timber

FIGURE 2.1-1
THE TIMBER MANAGEMENT PLANNING PROCESS
PLAN PRODUCTION

	1	2
	3	4
STEP ONE:	Assembly and Analysis of Background Information	5
STEP TWO:	Determination of Management Direction for the Management Unit	6
	(I) Establishment of Management Objectives and Strategies	7
	(II) Selection of Silvicultural System(s) and Determination of Silvicultural Ground Rules	8
	(III) Determination of Maximum Allowable Depletion	9
STEP THREE:	Identification of Potential Areas of Operations for the 20-year Period of the Timber Management Plan	10
	(I) Identification of Areas Eligible for Harvest, Renewal and Maintenance Operations	11
	(II) Identification of Preliminary Areas of Concern	12
	(III) Determination of the Type and General Location of Primary Access System	13
STEP FOUR:	Determination of Operations for the Five-Year Term of the Timber Management Plan	14
	(I) Estimation of Amount of Area to be Selected for Harvest	15
	(II) Determination of Renewal and Maintenance Program	16
	(III) Selection of Areas for Harvest, Renewal and Maintenance Operations	17
	(IV) Identification of Specific Areas of Concern	18
	(V) Determination of Operations:	19
	(a) Harvest, Renewal and Tending Operations	20
	(b) Access	21
		22
		23
		24
		25
		26
		27
		28
		29
		30
		31
		32
		33
		34
		35
		36

Management Plan by assembling and analyzing background information on the forest management unit. Particular emphasis is place on gathering information which contributes to the preliminary determination of where timber management activities may be carried out during the 20-year period, and the planning of operations for the five-year term.

MNR's Forest Resource Inventory (FRI) and existing inventory information on natural resources and land uses which is available at MNR's District offices serve as principal sources for the assembly of an inventory information base for the management unit which is suitable for timber management planning purposes. At the District, that inventory information is available on maps, in files and reports, and as knowledge of local MNR staff.

The Forest Resource Inventory (FRI)- For timber management planning purposes, the most important information source is the Forest Resource Inventory (FRI), which provides descriptive information about the timber resource on the Crown lands of each management unit, in the form of interpreted aerial photographs, forest stand maps and accompanying ledger data. The Forest Resource Inventory (FRI) is the principal information source for the identification of the areas of the management unit in which timber management activities may take place during the 20-year period of the Timber Management Plan, and more specifically, the areas in which operations will take place during the five-year term.

The "forested" portion of the Crown land area of a management unit is classified as either "non-productive forested land" or "productive forested land". Non-productive forested land can be described as land incapable of growing trees for commercial purposes because of very low productivity, and includes areas of muskeg, brush and alder, and barren rock. Productive forested land can be described as all forest areas which are capable of growing trees for commercial purposes and is further sub-divided into two categories: "protection forest" and "production forest".

Protection forest can be described as productive forested lands on which timber management activities cannot normally be practised without incurring deleterious environmental effects, because of obvious physical limitations such as steep slopes and shallow soils over bedrock.

Production forest can be described as productive forested land, at various stages of growth, with no obvious physical limitations on the ability to practise timber management. In simple terms, "production forest" equals "productive forested land" minus "protection forest". It is primarily on the production forest land area that timber management activities are planned and implemented. The implementation of those activities may involve operations (e.g. access road construction) on non-productive forested land and protection forest.

In the Forest Resource Inventory (FRI), estimates of the timber resources in individual forest stands are described on forest stand maps and accompanying ledger data. The key features of that forest stand data are: the tree species composition, age, height, stocking, site class, and area. The publication entitled "Forest Inventory Procedure for Ontario"⁵ provides a comprehensive explanation of MNR's provincially-based forest resource inventory system.

During the 20-year period, and more specifically, the five-year term, of the Timber Management Plan, timber management operations will take place on only a portion of the production forest land area, as determined in subsequent steps of the timber management planning process. As described in those steps, a variety of factors are considered in the determination of the amount of required operations, the area of the management unit in which those operations will be carried out, and the nature of the operations themselves. The forest stand data from the Forest Resource Inventory (FRI) provides a key contribution to that decision-making process.

For each management unit, a new Forest Resource Inventory (FRI) is produced every 20 years. During the 20-year life of that inventory, it is regularly updated as part of MNR's normal record-keeping system. In particular, in the initial stages of the preparation of each new Timber Management Plan, the inventory is updated to reflect changes to the forest land base which occurred during the previous five-year term. That update reflects changes due to harvest operations, successful renewal efforts, and aging of the forest; changes in the available land base; and changes due to natural forest disturbances such as forest fires.

In addition, operational cruise surveys may be conducted in the expected area of harvest operations for the five-year term in order to provide additional data on the timber resource for use in later steps of the planning process.

Existing information on other natural resource features, land uses and values (e.g. mineral resources, fish and wildlife resources, and recreational resources and uses) is available at MNR's District offices in the form of maps, files and reports, and knowledge of local MNR staff. Much of that information was amalgamated during MNR's land use planning exercise and is readily available for timber management planning purposes.

Additional inventory information is also available from regular resource inventories undertaken by the various MNR program groups, or other published sources. For example, landform information is available from a variety of sources, such as surficial geology maps. For some management units, soils information is available from soil surveys published by the federal government or recently produced by MNR. In various parts of the province, MNR has also developed additional localized data bases such as the Forest Ecosystem Classification data, which incorporates soils and vegetation information.

The District Land Use Guidelines themselves are an important source

of background information. In those documents, the area of each District is sub-divided into "land use areas", with accompanying statements of "land use intent" for each of those "land use areas". This information is particularly useful in STEP TWO of the planning process where general management direction for the management unit is established.

Other government ministries/agencies may serve as sources of additional inventory information. For example, the Ministry of Tourism and Recreation may provide information on existing tourism industry facilities and uses, as well as areas with identified tourism potential; and the Ministry of Citizenship and Culture may provide information on known and potential areas of archaeological and heritage resources.

Other interested external participants in the preparation of the Timber Management Plan may also contribute inventory information, in response to the first and second public notices during public consultation (Refer to PART TWO, Section 2.1.3). For example, provincially-based interest groups (e.g. the Northern Ontario Tourist Outfitters and the Ontario Federation of Anglers and Hunters), local field naturalist clubs, Band Councils of the Indian Reserves in the forest management unit, and any other native communities and organizations which are potentially affected, may contribute additional inventory information.

In this step of the planning process, all background inventory information from all available sources is reviewed and updated, as required. As described in PART THREE, Chapter 1, MNR has produced a number of guidelines for timber management operations in areas in which other resource features, land uses and values occur. Application of three provincial guidelines, which address the protection of fisheries habitat, moose habitat and areas of tourism value, is mandatory in STEP FOUR(V) of the planning process, and requires that minimum levels of inventory information be available.

In the absence of adequate minimum inventory information on those other resource features, land uses and values, additional data collection will be required. Such inventory efforts will be directed primarily to the portion of the management unit in which operations are expected to take place during the 20-year period of the Timber Management Plan, and more specifically, the five-year term.

The inventory information which is assembled on other resource features, land uses and values is analyzed and, where mappable, is summarized in the form of a "values map" for the management unit. That "values map", and an accompanying description of the identified resource features, land uses and values, represents a compendium of information on other resource features, land uses and values which must be considered in later stages of the planning process. While this information may contribute to the identification of where timber management operations may or will be carried out during the 20-year period and five-year term of the Timber Management Plan respectively, the principal role of that information is to contribute to the determination of areas in which comprehensive planning of timber management operations is required to ensure consideration of other resource features, land uses and values.

(NOTE: The actual areas of the management unit in which operations may take place during the 20-year period of the Timber Management Plan, and will take place during the five-year term, are not identified until STEP THREE and STEP FOUR of the planning process, respectively. However, a preliminary indication of the land area which will likely be the focus of operations can be made on the basis of the updated Forest Resource Inventory (FRI) information and records of the areal extent of past harvest and renewal operations.

Ultimately, the regular five-year renewal of the Timber

Management Plan will focus the requirements for additional inventory information on other resource features, land uses and values. This refinement of the area for which additional inventories may be required is possible because the areas where operations are likely to occur are identified for the 20-year period. Detailed inventory assembly for the next Timber Management Plan, therefore, can literally commence immediately upon approval of the Timber Management Plan under preparation.)

Other Background Information - In each Timber Management Plan, a Report of Past Forest Operations is required. That report is a summary of the annual reports and assessments of achievements for the previous five-year term. Information and recommendations arising from an analysis of the Report of Past Forest Operations provides an important contribution to later steps in the planning process, in particular the determination of general management direction for the management unit.

Information on the past, current and future wood supply requirements of the various users of the timber resource of the management unit must also be assembled.

In addition, resource management plans of other MNR program groups (e.g. District Fisheries Management Plans), and plans of other government ministries/agencies, such as the Ministry of Tourism and Recreation, the Ministry of Transportation and Communications, Ontario Hydro, and individual municipalities, also serve as sources of background information.

Finally, manuals and guidelines which provide technical direction for timber management planning are also important components of the background information. As discussed in PART THREE, Chapter 1, those documents include MNR's Silvicultural Guides and a number of guidelines for the consideration of other resource features, land uses and values in timber management planning.

For each management unit, the planning team is responsible for
assembling an inventory information base which is suitable for
timber management planning purposes, as well as any additional
relevant background information. Ultimately, the application of
the planning process in the renewal of the Timber Management Plan
at five-year intervals will result in the development of a
regularly-updated, comprehensive environmental data base for the
entire management unit.

STEP TWO: DETERMINATION OF MANAGEMENT DIRECTION
FOR THE MANAGEMENT UNIT

INTRODUCTION

General direction for the management of the timber resource of the
management unit must be determined. That general direction must,
first and foremost, provide for long-term continuity of management,
because the forest growth cycle, from harvest to harvest, extends
over a long period of time (i.e. from several decades to a century
or more). Secondly, that general direction must clearly establish
the framework within which timber management operations will be
implemented during the five-year term of the Timber Management
Plan.

As described in STEP ONE of the planning process, a Report of Past
Forest Operations is a required component of the assembly and
analysis of background information in each Timber Management Plan
for a management unit. Recommendations arising from an analysis of
that Report of Past Forest Operations provide a major contribution
to the determination of the general direction for future timber
management on the management unit.

In the determination of that general direction for management, the
initial requirement involves establishment of specific objectives
for the management of the timber resource of the management unit,
and strategies for the achievement of those objectives. Secondly,

for the various tree species, or groups of species, in the management unit, appropriate silvicultural systems of management are selected, and optional methods of carrying out harvest, renewal and maintenance operations for the selected silvicultural systems are determined and described in a set of Silvicultural Ground Rules. Thirdly, a calculation is made to determine the theoretical upper limit of the amount of area of the production forest of the management unit which could be harvested during the five-year term, assuming that the entire area is available for harvest. However, it should be noted that the entire area is seldom available for harvest, because lands may also be expended/depleted by other means than harvest (e.g. dedication to other land uses).

(1) ESTABLISHMENT OF TIMBER MANAGEMENT OBJECTIVES AND STRATEGIES

In the preparation of a Timber Management Plan, specific timber management objectives and strategies must be established for the individual management unit. In the establishment of those objectives and strategies, the following requirements are addressed:

- management objectives must be consistent with provincial policies and objectives;
- management objectives must be attainable, and, where feasible, measurable;
- management strategies must be consistent with the general direction provided in the District Land Use Guidelines; and
- there must be clear links between management objectives, strategies to achieve those objectives, and the timber management operations which are planned for implementation.

As described in PART TWO, Chapter 1, the objectives of MNR's Forest Resources Program in Ontario can be stated as: to provide for an optimum continuous contribution to the economy by forest-based industries, and to provide for other uses of the forest, through environmentally sound timber management practices. This provincial

program objective was considered, along with the provincial objectives of the other MNR programs, in MNR's land use planning exercise, and has been adapted to regional and local (i.e. District) conditions and circumstances. The product of that land use planning exercise was District Land Use Guidelines for most of MNR's administrative Districts. These guidelines included management objectives for the District's timber management program, and broad management strategies for their achievement.

In the preparation of a Timber Management Plan, these objectives and strategies are further refined and adapted to the conditions encountered in the individual management unit, where appropriate, in the formulation of specific timber management objectives and strategies for that management unit.

The District Land Use Guidelines contain a quantified "timber production target" for the District's Forest Resources Program. It must be understood that this figure represents a target for the District as a whole, and that its principal use is at the District level in order to track achievements over time. The timber production target in the District Land Use Guidelines is derived from information and assumptions which are more general in nature than those which are used for an individual management unit. In addition, the target is normally directed to a different time period than that addressed in a Timber Management Plan. Therefore, the timber production target in the District Land Use Guidelines, and the rationale behind it, will give only general guidance for the establishment of timber management objectives at the level of the individual management unit.

In addition to the statements of management objectives and strategies specifically related to the District's Forest Resources Program, the District Land Use Guidelines contain various statements of "land use intent". These statements relate to specific geographic areas, called "land use areas", within the District, and are accompanied by a set of management guidelines for

land use activities within each particular area. The statements of land use intent and the accompanying management guidelines are used in the formulation of management strategies to achieve the management objectives for the management unit which are consistent with MNR's Integrated Resource Management (IRM) policy.

There may be other plans in place for all or part of the management unit, such as resource management plans for other MNR programs (e.g. District Fisheries Management Plans) or plans of other government ministries/agencies, such as the Ministry of Tourism and Recreation, the Ministry of Transportation and Communications, Ontario Hydro, or individual municipalities. Such plans are also referenced in the establishment of management objectives and strategies for the management unit, in order to ensure consideration of the objectives and contents of those plans in the development of the Timber Management Plan.

Management objectives in a Timber Management Plan must be attainable, and, where feasible, measurable. As an example, the primary management objective which must be established addresses the wood supply requirements of the various industrial users of the timber resource of the management unit. That timber production objective must state the quantities of timber of various species which are planned for harvest during the five-year term of the Timber Management Plan.

The specific management objectives which are established for an individual management unit are based on local conditions and information. In the establishment of these specific management objectives, a number of interrelated factors are considered, such as:

- the attributes of the land base and existing forest which influence the ease and cost of management effort (e.g. soil types, topography, species and age of trees, etc.);
- the wood requirements of various users, expressed in terms

- of desired species and quality, as well as quantity and timing requirements; 1
- utilization measures to be used or pursued in harvest and processing operations to ensure the fullest use of the timber resource; 2
- the need to respond to natural forest disturbances, such as forest fires and insect infestations, by planning for management activities, where feasible, following such a disturbance; 3
- consideration of the attributes which the forest of the future could have, as a result of various management strategies; 4
- economic and social factors which influence, or are influenced by, timber management activities; and 5
- the needs of other Crown land resource users. 6

These factors are also considered when making planning decisions at later steps in the planning process. 7

In the preparation of a Timber Management Plan, it is also necessary to develop strategies for the achievement of objectives for the management of the timber resource on the management unit. Some very broad management strategies are included in the regional Strategic Land Use Plans and the District Land Use Guidelines. Examples of such broad strategies are: 8

- (i) "encouraging the increased industrial utilization of hardwoods and other under-utilized tree species..." (MNR, 1982. "Northwestern Ontario Strategic Land Use Plan")⁶; and 9
- (ii) "employing techniques to increase forest yield...and the development and maintenance of a tree improvement program..." (MNR, 1983. "Dryden District Land Use Guidelines")⁷. 10

Such broad management strategies require further refinement in the 11

preparation of a Timber Management Plan in order to identify the specific management strategies which will direct operations on the management unit. For example, the broad strategy to promote full utilization of the available timber resource may be further refined into more specific strategies such as development of access roads into areas of mature or overmature timber, or application of a higher level, and accelerated rate, of harvest in order to minimize deterioration of overmature timber. The broad strategy to improve productivity may also be refined into more specific strategies such as application of intensive management practices on the best sites, conversion to more productive species, or use of genetically-improved planting stock.

MNR's provincial Forest Resources Program objective also includes a requirement to provide for other uses of the forest. MNR's Integrated Resource Management (IRM) policy is directed at achievement of this component of the provincial objective, and some broad management strategies which address that policy are presented in the District Land Use Guidelines. In order to make those strategies applicable to an individual management unit, further refinement is required in the preparation of a Timber Management Plan, through the application of the planning process discussed in this chapter. Additional strategies which are specific to the management unit may also be developed in the application of the planning process, which provides for the comprehensive planning of timber management operations to ensure consideration of other resource features, land uses and values.

(II) SELECTION OF SILVICULTURAL SYSTEMS AND DETERMINATION OF SILVICULTURAL GROUND RULES

The principal means by which the timber management strategies for the management unit are implemented is through the application of appropriate silvicultural system(s) for the management of the various tree species, or groups of species, which occur in the management unit. The range of acceptable silvicultural practices

which can be employed in the implementation of the appropriate silvicultural system(s) for each tree species, or group of species, is described in a set of Silvicultural Ground Rules.

Selection of Silvicultural System(s) - As described in PART ONE, Chapter 9, there are three silvicultural systems in use in Ontario: the clear cut system, the shelterwood system, and the selection system. Each of these systems is normally associated with a specific forest region, specific tree species, or groups of species, and/or site conditions which occur in the forest region, and specific end-product requirements.

An appropriate silvicultural system is selected for each "working group" or "forest unit" in the management unit. A working group is defined as an aggregate of forest stands having the same predominant species. A forest unit is defined as either: (i) an aggregate of forest stands having the same predominant species, further differentiated by site conditions; or (ii) an aggregate of forest stands of various species grouped for specific management purposes.

In the selection of the appropriate silvicultural system(s) for each working group/forest unit, the following factors are taken into consideration:

- the existing tree species;
- the age class distribution;
- the desired composition of the future forest (i.e. same species versus different species);
- the desired age structure of the future forest (i.e. even-aged versus uneven-aged); and
- the end-product requirements (i.e. pulpwood, sawlogs, veneer, etc.).

MNR's Silvicultural Guides (Refer to PART THREE, Chapter I) provide general direction for the selection of the appropriate

silvicultural system(s) for specific working groups.

Determination of Silvicultural Ground Rules- For each working group/forest unit in the management unit, optional methods of carrying out harvest, renewal and maintenance operations for the selected silvicultural system(s), and the desired results of renewal efforts, are determined and described in a set of Silvicultural Ground Rules. The Silvicultural Ground Rules describe those optional methods as a range of acceptable silvicultural practices which can be employed in the management of areas of similar site conditions within each working group/forest unit, and represent "normal" management practice for the management unit.

In the development of the Silvicultural Ground Rules, the management unit forester applies his/her professional expertise and makes use of a variety of information sources. Various documents, such as MNR's provincial Silvicultural Guides (Refer to PART THREE, Chapter 1) and an assortment of professional and scientific literature, represent a published information base. Local information and knowledge pertaining to the site conditions encountered in the management unit, and knowledge and experience gained on the management unit, are also considered.

Each Silvicultural Guide provides a description of the silvical characteristics of the working group species, and outlines methods of acceptable silvicultural practice which are commonly implemented across the province. Each guide reflects the history of experience, knowledge and available research results in the management of the working group in Ontario. At the individual management unit level, the guides are interpreted and adapted to local conditions, and in combination with the professional judgement exercised by the management unit forester, result in the formulation of a set of Silvicultural Ground Rules which is specific to the particular management unit.

A variety of sources are used to obtain the necessary information on local conditions. For all management units, Forest Resource Inventory (FRI) maps provide some information on site conditions (i.e. site class) in individual forest stands. Landform information (i.e. physiography and topography) is obtained from a variety of sources, such as surficial geology maps. In some management units, soils information is available from soil surveys published by the federal government or recently produced by MNR. Soils information is also a component of survey data used in the development of such additional localized data bases as MNR's Forest Ecosystem Classification program in various parts of the province.

In addition, and particularly in the absence of published information, air photo interpretation, accompanied by field inspection, serves as a source of information on local conditions.

Information on past management practices on the management unit is obtained from a variety of sources. The local knowledge and experience of the management unit forester and forest technicians, and their predecessors, and an analysis of the results of previous management plans, serve as important sources of information. In particular, recommendations arising from an analysis of the required Report of Past Forest Operations in each Timber Management Plan are an important contribution.

Evaluation of the success of past renewal and maintenance practices involves interpretation of the results of various regeneration surveys, such as survival assessments, stocking assessments and "Free-to-Grow" surveys. That evaluation also contributes to the development of Silvicultural Ground Rules.

In the development of the Silvicultural Ground Rules for a Timber Management Plan prepared by a forest company with a Forest Management Agreement (FMA), the Silvicultural Specifications and Standards component of the FMA Ground Rules which were negotiated in the agreement also serve as a source of information.

(III) DETERMINATION OF MAXIMUM ALLOWABLE DEPLETION

The Maximum Allowable Depletion represents the basis for regulation of the forest in order to achieve the timber production objective for the management unit. Determination of the Maximum Allowable Depletion involves a repetitive mathematical calculation which normally considers three time horizons:

- (i) a short-term horizon of five years (i.e. the term of the Timber Management Plan);
- (ii) a medium-term horizon of 20 years (i.e. the period of the Timber Management Plan); and
- (iii) a long-term horizon of the forest rotation, which is typically 80 to 100 years, or longer.

While the short-term horizon of five years is the key term for the calculation of the Maximum Allowable Depletion, an analysis of the implications of the five-year Maximum Allowable Depletion is undertaken to ensure consideration of any effects on the achievement of timber production objectives which are of a longer-term nature.

The Maximum Allowable Depletion is the calculated amount of the production forest land area within the management unit from which timber may be expended/depleted during the five-year term of the Timber Management Plan. The Maximum Allowable Depletion represents the theoretical upper limit of the amount of area of the production forest of the management unit which could be harvested during the five-year term, assuming that the entire area is available for harvest. However, it should be noted that the entire area is seldom available for harvest, because lands may also be expended/depleted by other means than harvest. In particular, timber management activities may not occur in some of that area as a result of decisions which are made during later stages of the planning process (i.e. decisions arising from the consideration of other resource features, land uses and values as described in STEP

FOUR(V) of the planning process). As well, timber may also be expended/depleted by fire, insect and disease infestations, or allocation to other uses.

The Maximum Allowable Depletion is determined for each working group/forest unit in the management unit, and is expressed as an area figure. A number of criteria are incorporated into the repetitive mathematical calculation; the results of those calculations are analyzed and an appropriate Maximum Allowable Depletion is selected. This analysis involves an evaluation of the effects of various sets of criteria on the ability to achieve the timber production objective for the management unit. The results of that analysis provide the basis, and supporting rationale, for the selection of an appropriate Maximum Allowable Depletion for each working group/forest unit in the management unit.

The calculation of the Maximum Allowable Depletion involves the application of specific mathematical formulae for individual silvicultural systems which have been selected for each working group/forest unit (Refer to STEP TWO(II)). The principal input to the calculation is the data on area by age classes for each working group/forest unit, which is extracted from the data base of the Forest Resource Inventory (FRI); that data remains consistent in all repetitions of the Maximum Allowable Depletion calculation.

The other criteria which may enter the calculation include:

- the rotation/cutting cycle for the particular working group/forest unit, expressed in years;

(NOTE: The "rotation", which applies to even-aged management systems (i.e. the clear cut and shelterwood silvicultural systems), is the planned number of years between complete harvests of successive forest crops on the same land area. Normally, the rotation is between 60 to 120 years.

The "cutting cycle", which applies to uneven-aged management systems (i.e. the selection silvicultural system), is the planned period between partial harvests on the same land area. Normally, the cutting cycle is in the order of 15 to 20 years.)

- the expected success of regeneration efforts, expressed as a percent;
- the estimated time between harvest and achievement of "Free-to-Grow" status, expressed in years;
- the estimated land area which will be taken out of production due to its use for roads and landings, expressed as a percent; and
- the estimated extent of "Not Satisfactorily Regenerated (NSR)" areas which is expected to achieve "Free-to-Grow" status during the five-year term (i.e. the NSR renewal rate), expressed as a percent.

Each of these criteria is treated as a variable in the calculation. Different combinations of values for each of the variables are entered into the calculation, and an analysis is carried out to assess the ability of those various combinations to achieve the timber production objective for the management unit. The results of that analysis permit the selection of an appropriate Maximum Allowable Depletion, and the corresponding values of the variables, for the particular working group/forest unit for the five-year term.

As previously described, the medium-term horizon of the 20-year planning period, and the long-term horizon of the forest rotation, are also considered in the determination of the Maximum Allowable Depletion. Therefore, for each of the other three five-year terms of the 20-year planning period, the Maximum Allowable Depletion is re-calculated, based on the assumption that the entire Maximum Allowable Depletion for the previous five-year term(s) has been expended/depleted. The results of those calculations are

summarized for the 20-year period, and provide an indication of the amount of land area from which timber could be expended/depleted during those three successive five-year terms.

Since forest stands are grouped into 20-year age classes in the Forest Resource Inventory (FRI), the Maximum Allowable Depletion may also be calculated using 20-year age class groupings. This calculation is undertaken in order to evaluate the level of wood supply which can be sustained from the management unit into the future. This long-term calculation models the future age class structure of the forest for the forest rotation, or longer, and enables a prediction to be made of the future levels of a suitable wood supply.

The determination of the Maximum Allowable Depletion is a key step in the timber management planning process at which the iterative nature of the planning process is particularly apparent. Specifically, the analysis of the results of the repetitive calculation of the Maximum Allowable Depletion, using various combinations of values of variables, may require re-examination of the timber management objectives for the management unit, previously established in STEP TWO(1) of the planning process.

In subsequent Timber Management Plans, the Forest Resource Inventory (FRI) data base is updated to reflect changes to the forest land base which occurred during the previous five-year term. The update of the production forest land area will reflect not only changes related to the land area which has been harvested and successfully renewed, but also changes which can be attributed to natural forest disturbances, such as forest fires and insect infestations. Those changes will reflect primarily changes to the age class structure of the forest. The determination of the Maximum Allowable Depletion for the next Timber Management Plan will, therefore, involve an entirely new data base in the repetitive calculation for the forest conditions which exist at that time.

A comprehensive explanation of the methodologies used in the calculation of the Maximum Allowable Depletion is presented in APPENDIX B of the "Timber Management Planning Manual for Crown Lands in Ontario"¹.

STEP THREE: IDENTIFICATION OF POTENTIAL AREAS OF OPERATIONS FOR THE TWENTY-YEAR PERIOD OF THE TIMBER MANAGEMENT PLAN

INTRODUCTION

The land area of the management unit on which harvest, renewal and specified maintenance operations (i.e. tending only) may be carried out during the 20-year period of the Timber Management Plan is identified. Within that land area, areas in which other resource features, land uses or values occur are identified in a preliminary way. The combination of those two pieces of information contributes to the determination of the general location(s) of the new primary access roads which are required for the management unit.

(NOTE: Because of the unpredictable nature of insect and disease infestations, the land area of the management unit on which protection operations may be required can only be identified for the next five-year term. Therefore, in describing maintenance operations for the 20-year period, only the tending component of the maintenance activity is discussed.)

The initial application of the timber management planning process to each management unit in the province will require complete application of this step of the process as a "new" exercise. On the assumption that the management direction for the management unit (Refer to STEP TWO) does not change substantially, subsequent applications of the planning process at the regular five-year renewals of the Timber Management Plan will focus on a review, update and refinement of the products of this step for the

remaining 15 years of the original Timber Management Plan, and the addition of a geographic area which is eligible for operations for an additional five years.

(I) IDENTIFICATION OF AREAS ELIGIBLE FOR HARVEST, RENEWAL AND MAINTENANCE OPERATIONS

Although for the most part interrelated, areas eligible for harvest, renewal and tending operations during the 20-year period of the Timber Management Plan are identified separately on the basis of criteria specifically established for the management unit.

Identification of Area Eligible for Harvest - The land area of the management unit which is eligible for harvest operations during the 20-year period of the Timber Management Plan is identified and displayed on forest stand maps of the Forest Resource Inventory (FRI). Individual forest stands which are considered to be eligible for harvest operations during the 20-year period are identified on the basis of a set of harvest eligibility criteria which is developed specifically for the management unit. Factors which are considered in the determination of these criteria include:

- the maturity/age of trees/stands;
- the possibility of deterioration of product quality in areas where natural forest disturbance, such as a forest fire or insect infestation, has occurred; and
- the need to identify specific types of area as eligible for harvest in order to allow for the achievement of a particular management objective.

Identification of Areas Eligible for Renewal and Tending - The land area of the management unit which is eligible for renewal and tending operations during the 20-year period of the Timber Management Plan is also displayed on forest stand maps of the Forest Resource Inventory (FRI), normally on the same set of maps

which is used to display areas eligible for harvest. Individual forest stands and areas which are considered to be eligible for renewal and tending operations are identified on the basis of information which indicates that those operations may be required during the 20-year period to ensure the achievement of the management objectives for the management unit.

The following types of areas are generally considered to be eligible for renewal and tending operations:

- all, or most of, the land area which is eligible for harvest operations during the 20-year period;
- areas in which a natural disturbance, such as a forest fire, has occurred, and which require renewal or tending;
- areas which have not yet been satisfactorily renewed or which require tending; and
- areas in which the achievement of a particular management objective is desired.

Common sources of information on the land areas which have not yet been satisfactorily renewed or which require tending include the Forest Resource Inventory (FRI), and previously-conducted survival assessments, stocking assessments, "Free-to-Grow" surveys and surveys of "Not Satisfactorily Regenerated (NSR)" areas for the management unit.

Projected Operating Areas - Frequently, due to the preponderance of mature and overmature forest stands, the area of the management unit which is eligible for harvest, renewal and tending operations is considerably in excess of the requirements for those operations during the 20-year period of the Timber Management Plan. An opportunity is provided, therefore, to identify the area within the total eligible area where operations are most likely to be carried out during the 20-year period. That area is termed the "projected operating area" for harvest operations, and subsequent renewal and

tending operations.

The provision for a projected operating area will focus the remaining steps in the planning process on the most probable area of operations. Whenever the option of a projected operating area is used in the preparation of a Timber Management Plan, a rationale for the determination of the geographical extent of that area must be provided. The area also must be portrayed in a generalized format on the previously-prepared set of eligibility maps.

(II) IDENTIFICATION OF PRELIMINARY AREAS OF CONCERN

In the timber management planning process, concerns of other MNR program groups, other Crown land resource users, and interested external participants regarding timber management operations are addressed primarily through the identification of, and comprehensive planning of operations within, areas in which other resource features, land uses or values occur. Such areas, termed "areas of concern" are defined as:

"geographically-defined areas of value to other users/uses which could be affected by timber management operations, including roads, and which may require modifications to those operations".

Preliminary areas of concern are identified within either of:
(i) the entire area eligible for operations during the 20-year period of the Timber Management Plan, or (ii) the projected operating area for the 20-year period, using the inventory information assembled, analyzed, and summarized in the form of a "values map" in STEP ONE of the planning process. As part of the identification of preliminary areas of concern, an accompanying description of the resource features, land uses or values which require protection in each area is also produced.

Preliminary areas of concern may also be identified in other parts

of the management unit where new primary access roads are required to provide access to either of: (i) the entire area eligible for operations during the 20-year period of the Timber Management Plan, or (ii) the projected operating area for the 20-year period.

The District Land Use Guidelines are a particularly useful source of background information for the identification of these preliminary areas of concern. Contributions from other MNR program groups, other government ministries/agencies, such as the Ministry of Citizenship and Culture and the Ministry of Tourism and Recreation, and other interested external participants, in response to public consultation opportunities, are also particularly important at this step of the planning process.

The identification of preliminary areas of concern serves as the initial indication that comprehensive planning of timber management operations in those areas will be required, if and when that land area is selected for operations during a five-year term. Perhaps most importantly, however, the identification of preliminary areas of concern serves as a major contribution to the determination of the general location(s) of the new primary access roads which are required for the management unit.

The concept of "areas of concern" is formally addressed in MNR's "Policy for the Integration of Other Resource Values in Timber Management"⁸ and the accompanying procedure for its implementation.

(III) DETERMINATION OF THE TYPE AND GENERAL LOCATION OF PRIMARY ACCESS SYSTEM

Accessibility is critical to timber management on a management unit. The type of access system normally used in Ontario is a road network, although there are situations where a combination of roads and rivers/lakes or railways is used, primarily for the transportation of roundwood from the management unit to wood-processing facilities.

Development of a road network to provide access to and from new areas of harvest operations, and on occasion, renewal and maintenance operations, is normally required. That road network represents the "primary" access system for the management unit. The planning of any additions to the primary access system is undertaken in two stages:

- a broad corridor planning stage for primary access roads which are required to provide access to either of: (i) the entire area eligible for operations during the 20-year period of the Timber Management Plan, or (ii) the projected operating area for the 20-year period; and
- detailed planning of the location of each primary access road which is required for the five-year term.

In the broad corridor planning stage, for each primary access road which is required, a general road location (i.e. a corridor of approximately 1 km width) must be determined. The determination of that general location for each required primary access road involves:

- consideration of alternative 1 km wide corridors;
- a broad environmental analysis of those corridors; and
- the ultimate selection of a preferred/most acceptable corridor.

Normally, alternative corridors for each required primary access road are identified. In some cases, however, only one corridor may be considered to be suitable. In such situations, a broad environmental analysis of the proposed corridor must still be produced. The supporting rationale for the selected corridor will provide justification for the decision that no other suitable alternative corridors could be identified.

The identification of a single corridor, or alternative corridors,

or each required primary access road incorporates consideration of the preliminary areas of concern, normally by attempting to avoid, or minimize intrusion into, those areas. On occasion, however, a decision may be made to identify and ultimately select a suitable corridor within such areas.

The broad environmental analysis of the single corridor, or alternative corridors, addresses three major criteria:

- effectiveness of access to the entire area eligible for, or the projected operating area for, harvest, renewal and tending operations;
- accommodation of preliminary areas of concern; and
- estimated construction, transportation and maintenance costs.

An additional consideration which could contribute to the analysis of alternative corridors involves "use management strategies". For primary access roads, use management strategies would normally consist of mechanisms to control use, such as restrictions on use or various forms of road closure. MNR's "Resource Access Roads Policy and Implementation Strategies and Guidelines"⁹ provide a comprehensive description of the requirements for use management strategies for access roads.

The results of the analysis of the alternative corridors provide the basis, and the supporting rationale, for the selection of the preferred/most acceptable corridor for each required primary access road.

STEP FOUR: DETERMINATION OF OPERATIONS FOR THE FIVE-YEAR TERM OF THE TIMBER MANAGEMENT PLAN

INTRODUCTION

The amount of area of each working group/forest unit which is

selected for harvest operations during the five-year term of the Timber Management Plan is guided by the Maximum Allowable Depletion, previously determined in STEP TWO(III) of the planning process, in conjunction with a forecast of the wood volume requirements of the various users of the timber resource from the management unit. The amount of renewal and maintenance required during the five-year term to ensure the achievement of the management objectives for the management unit, in particular the long-term timber production objective, is also determined.

The land area of the management unit on which harvest, renewal and tending operations will be carried out during the five-year term is then selected. The geographical extent of the area selected for each of these operations will be largely coincident, but there will be differences, simply because the operations occur in sequence. Within that land area, specific "areas of concern" which require special consideration in the planning of operations are identified. Operations which will be carried out in all areas selected for operations for the five-year term are then determined, with comprehensive planning requirements for specific areas of concern.

(NOTE: Because of the unpredictable nature of insect and disease infestations, only the land area on which protection operations may be carried out, if required, during the five-year term, can be identified. The determination of the actual protection operations which will be carried out involves annual planning requirements as described in APPENDIX III.)

The locations of access roads which are required to provide access to, and within, the areas selected for harvest, renewal and tending operations during the five-year term are also determined. The locations of primary, and frequently secondary, access roads to areas beyond the areas selected for harvest, renewal and tending operations for the five-year term must also be determined, because of the requirement for construction of those roads in advance of

those operations. For those road requirements, a preliminary indication of the expected area of operations for at least part of the next five-year term is required. Supporting rationale for that expected area of operations is also required.

(I) ESTIMATION OF AMOUNT OF AREA TO BE SELECTED FOR HARVEST

An estimate of the amount of area to be selected for harvest operations during the five-year term of the Timber Management Plan is determined by initially producing a forecast of the wood volume requirements of the various users of the timber resource from the management unit. That volume forecast, by tree species and end-product requirements, is based on past records of wood utilization, and projections of utilization trends.

Secondly, for each working group/forest unit in the management unit, average volumes per unit of area are derived from analysis of information which is available in a variety of sources, including the Forest Resource Inventory (FRI), operational cruise surveys, and local knowledge and experience. This area/volume relationship is used in conjunction with the calculated Maximum Allowable Depletion for each working group/forest unit to provide a preliminary indication or estimate of the amount of volume which could be realized from an average group of forest stands if they were selected for harvest operations up to the level of the calculated Maximum Allowable Depletion.

The calculated Maximum Allowable Depletion for each working group/forest unit, therefore, serves as a guide, in conjunction with the forecast industrial wood volume requirements, in the determination of the amount of area of forest stands to be selected for harvest operations.

(II) DETERMINATION OF RENEWAL AND MAINTENANCE PROGRAM

The amount of renewal and maintenance required during the five-year

term is that which is required to ensure the achievement of the long-term timber production objective for the management unit. More specifically, the amount of renewal and maintenance required should reflect the estimates of the expected success of regeneration efforts and the expected achievements of "Free-to-Grow" status which were incorporated into the calculation of the Maximum Allowable Depletion in STEP TWO(III) of the planning process. Those estimates are based primarily on the results of previously-conducted survival assessments, stocking assessments, "Free-to-Grow" surveys, and surveys of "Not Satisfactorily Regenerated (NSR)" areas for the management unit.

(III) SELECTION OF AREAS FOR HARVEST, RENEWAL AND MAINTENANCE OPERATIONS

From the portion of the production forest land area of the management unit which was identified as either eligible for, or projected for, harvest, renewal and tending operations during the 20-year period of the Timber Management Plan, specific areas are selected separately for harvest, renewal and tending operations during the five-year term. As previously discussed, the geographical extent of the areas selected for each of those operations will be largely coincident, but there will be differences, simply because the operations occur in sequence.

Selection of Areas for Harvest - As previously discussed in STEP FOUR(I) of the planning process, the calculated Maximum Allowable Depletion serves as a guide in the determination of the amount of area of stands to be selected for harvest operations in an attempt to match the forecast industrial wood volume requirements. From the areas previously identified on Forest Resource Inventory (FRI) maps as eligible for, or projected for, harvest during the 20-year period of the Timber Management Plan, individual forest stands for each working group/forest unit in the management unit are selected for harvest operations during the five-year term.

The selection of forest stands for each working group/forest unit has two dimensions:

- (i) identification of individual forest stands on Forest Resource Inventory (FRI) maps, which directly provides information on stand area; and
- (ii) reference to Forest Resource Inventory (FRI) ledger data and operational cruise surveys to obtain volume estimates for individual forest stands; volume estimates for individual tree species within each forest stand are then derived from that stand volume estimate.

(NOTE: The Forest Resource Inventory (FRI) ledger data provide volume estimates on the basis of the full tree. Since portions of the full tree volume are not normally utilized by industry (e.g. tree tops), deductions are made in order to obtain volume information which directly relates to the forecast industrial wood volume requirements.)

Forest stands are selected for harvest operations on the basis of a refined set of harvest selection criteria which is specifically established for the management unit. That set of harvest selection criteria is normally developed by considering factors such as:

- industrial requirements;
- the maturity/age of trees/stands;
- the level of capital investment required to conduct an operation (e.g. to construct new access roads);
- opportunities to harvest within areas of natural forest disturbance;
- previous commitments to harvest areas during this five-year term (i.e. return cuts);
- the operability of an area (i.e. physical, topographical and economic constraints); and
- the need to harvest certain types of areas to achieve a

particular management objective.

In the selection process, forest stands are normally selected to the level of the calculated Maximum Allowable Depletion for each working group/forest unit. Cumulative totals of the area of those forest stands, and the accompanying volume estimates for each tree species which occurs in those stands are generated, for ultimate comparison to the calculated Maximum Allowable Depletion and the forecast industrial wood volume requirements respectively. The result of these compilations is a summary of the estimated volume of each tree species, organized by working group/forest unit, for the total selected area.

The identification and comprehensive planning of operations in specific areas of concern to other MNR program groups and other Crown land resource users (Refer to STEP FOUR(V) of the planning process) may result in some of the land area, and consequently some of the volume estimate, of individual forest stands to be unavailable for harvest. Therefore, as part of the normal iterative nature of the planning process, the results of the planning of operations in specific areas of concern must be taken into account in the compilations and comparisons. The result of this iterative process is the identification of the portion of the total selected area which is "available for harvest".

For that area which is available for harvest, the ability to meet the forecast industrial wood volume requirements is determined by comparing the total volume estimates for each species in all working groups/forest units to the forecast industrial wood volume requirements. In that comparison, if the forecast industrial wood volume requirements and the estimated volume from the area which is available for harvest match, that area is the "planned harvest" area. However, this is seldom the case; rather, the forecast industrial wood volume requirements are usually either less than, or greater than, the estimated volume from the area which is available for harvest.

Surplus - If the forecast industrial wood volume requirements are less than the estimated volume from the area which is available for harvest, the planned harvest area is identified within that available area. The balance will be a "surplus area".

Within the planned harvest area, there may be unrequired volumes of some species which are in excess of the forecast industrial wood volume requirements.

(NOTE: When an area surplus situation exists, the planning of timber management operations in the area of surplus may be undertaken during the preparation of the Timber Management Plan. Alternatively, the planning of operations may be undertaken at some later time during the five-year term of the Timber Management Plan, in accordance with the procedures for an amendment to an approved Timber Management Plan, as described in PART TWO, Section 2.1.5.2.)

Deficits - If the forecast industrial wood volume requirements are greater than the estimated volume from the area which is available for harvest, there will be a "deficit".

Deficits are not normally met by exceeding the calculated Maximum Allowable Depletion, but rather by obtaining additional wood volume requirements from elsewhere (e.g. private lands or unrequired volumes from adjacent forest management units). In some situations, however, it may be necessary or desirable to exceed the calculated Maximum Allowable Depletion and select additional stands. Justification for decisions to select stands beyond the level of the calculated Maximum Allowable Depletion must be produced. Appropriate adjustments will be made in the preparation of the subsequent Timber Management Plan(s) to ensure a continuous long-term wood supply.

Selection of Areas for Renewal and Maintenance - From the areas previously identified on Forest Resource Inventory (FRI) maps as

eligible for, or projected for, renewal and tending operations during the 20-year period of the Timber Management Plan, individual areas are selected for renewal and tending operations during the five-year term.

For the amount of renewal and maintenance required to ensure the achievement of the long-term timber production objective for the management unit, previously determined in STEP FOUR(II) of the planning process, areas are selected for renewal and tending operations during the five-year term. The following types of areas are normally considered:

- areas which can be renewed naturally within the five-year term, with some assistance through site preparation;

(NOTE: There are areas which can be renewed naturally, without assistance; such areas, are selected, and identified for renewal on Forest Resource Inventory (FRI) maps, but no operations will be required.)

- areas which can be renewed artificially within the five-year term, as determined by:
 - (i) an analysis of the capability and operability of the sites, and
 - (ii) consideration of the availability of suitable equipment and/or labour force, acceptable planting stock and/or seed, suitable access, and anticipated funding levels;
- areas which require tending within the five-year term:
 - (i) to maintain, or return to, "Free-to-Grow" status, or
 - (ii) to improve stand conditions; and
- specific areas in which operations are required during the five-year term to achieve a particular management

objective.

(NOTE: As previously discussed, because of the unpredictable nature of insect and disease infestations, it is not possible to define specifically the land areas on which protection operations will be carried out during the five-year term. However, areas eligible for protection operations, if required, during the five-year term of the Timber Management Plan are identified, on the basis of a set of selection criteria which defines "commercially operable" and "high value" forests, as well as other forest stands of high commercial value. Commercially operable forests normally comprise all forest stands which are eligible for harvest in the short-term future (i.e. during the next 10 years). High value forests include seed production and seed collection areas, research areas, and areas of regeneration less than 20 years old.)

Contingency Areas - Unpredictable circumstances may arise during the five-year term of the Timber Management Plan, causing the area selected for harvest operations to no longer be available (e.g. as a result of a forest fire), or requiring harvest operations to move to another area of the management unit (e.g. in response to changes in forest product markets or seasonal inoperability or inaccessibility). In order to permit the continuation of harvest operations and minimize the requirement for an unscheduled renewal of, or an amendment to, the Timber Management Plan (Refer to PART TWO, Section 2.1.5), selection of an area of harvest operations which can serve as a replacement area is required in the preparation of the Timber Management Plan. This area, termed a "contingency area", may or may not exceed the calculated Maximum Allowable Depletion, and must be specifically identified on Forest Resource Inventory (FRI) maps. A contingency area is intended to serve as a replacement area for harvest operations during the five-year term, not as an additional area.

The amount of the contingency area will be limited. As a minimum, the amount of the contingency area will be equivalent to the area required to sustain harvest operations for a period of 90 to 120 days. The maximum amount of a contingency area will be equivalent to the area required to sustain harvest operations for a period of one year.

The selection of individual forest stands for the contingency area may occur in conjunction with the selection of stands for harvest during the five-year term, or as a separate exercise. In either case, the same selection process as previously described for the selection of areas for harvest applies and the cumulative totals of the area of forest stands, and the accompanying volume estimates, must be generated and recorded.

The planning of access roads and harvest, renewal and tending operations for a contingency area must be completed in the preparation of the Timber Management Plan. Operations will only be permitted in a contingency area upon future approval of an administrative amendment to the approved Timber Management Plan (Refer to PART TWO, Section 2.1.5.2). If operations are not carried out in a contingency area during the five-year term, that area will normally become part of the area selected for harvest operations for the next five-year term, in the preparation of the next Timber Management Plan.

(IV) IDENTIFICATION OF SPECIFIC AREAS OF CONCERN

In the planning of the harvest, renewal and tending operations which will be carried out during the five-year term, it is necessary to identify specifically the geographical areas in which there are other resource features, land uses and values to be considered. Therefore, specific "areas of concern" are identified within the areas selected for harvest, renewal and tending operations during the five-year term. This identification of specific areas of concern is primarily a refinement of, and

addition to, the preliminary areas of concern previously identified in STEP TWO(II) of the planning process.

Inventory information previously assembled, analyzed and summarized in the form of "values map" in STEP ONE of the planning process is used in the identification of those specific areas of concern and the accompanying description of the resource features, land uses and values which require protection in each area. In addition, any detailed resource inventory surveys conducted by other MNR program groups and other government ministries/agencies, such as the Ministry of Citizenship and Culture and the Ministry of Tourism and Recreation, in the areas selected for operations during the five-year term will also contribute to the identification of specific areas of concern. Contributions from other interested external participants, in response to public consultation opportunities, are also particularly important at this step of the planning process.

The identification of specific areas of concern may influence the selection of areas for harvest, renewal and tending operations, through the normal feedback mechanism within the planning process. Most importantly, however, the identification of specific areas of concern specifies those areas in which comprehensive planning requirements, as described in STEP FOUR(IV), apply.

Specific areas of concern are also identified in all areas of the management unit in which new access roads will be required during the five-year term. Access roads will be constructed within the areas which have been selected for harvest, renewal and tending operations during the five-term. In addition, primary, and frequently secondary, access roads must be constructed in areas beyond those selected areas, in advance of the harvest, renewal and tending operations which are expected to be carried out during the next five-year term.

It is therefore necessary to identify specific areas of concern in all areas where primary and secondary access roads are required.

For each required primary road, those specific areas of concern
will be identified within the 1 km wide corridor previously
established for the 20-year period of the Timber Management Plan.

(V) DETERMINATION OF OPERATIONS

For specific areas of concern within the areas selected for
harvest, renewal and tending operations during the five-year term,
comprehensive planning of those operations is required, and
normally results in the production of specific prescriptions for
harvest, renewal and/or tending operations which will be carried
out. In addition, precise locations (i.e. maximum 100 m width) for
primary and secondary access roads which are required within any
specific area of concern must be determined, as well as any
necessary conditions on required tertiary access roads.

For the remainder of the areas selected for harvest, renewal and
tending operations, the Silvicultural Ground Rules, previously
determined in STEP TWO(II) of the planning process, will apply.
Those ground rules represent "normal" management practice for the
management unit, and the area of operations to which they apply
becomes labelled "normal operating areas". The Silvicultural Ground
Rules describe the range of silvicultural practices which can
achieve the management objectives for the management unit, and are
designed to ensure that the timber resource itself, and related
soils and site characteristics, are protected. Implementation of
any of the practices described in the Silvicultural Ground Rules is
expected to result in minimal and acceptable environmental effects,
because no particular resource features, land uses or values which
could be negatively affected have been identified in the land area
to which they apply. Final prescriptions for harvest, renewal and
tending operations in normal operating areas are determined
annually in the production of the Annual Work Schedule (Refer to
PART TWO, Section 2.2).

The comprehensive planning process for specific areas of concern is

applied to individual areas of concern or types of associated areas of concern, such as shorelands of lake trout lakes and deer yards.

That comprehensive planning process initially requires that the following question must be answered:

"Can timber management operations be carried out while protecting the other identified resource features, land uses or values?"

If the answer to that question is "NO", the area of concern, or a part thereof, will normally become a "reserve" in which no timber management operations will be permitted.

If the answer to that initial question is "YES", the following second question must be answered:

"If operations can be carried out, how can they proceed (i.e. in the "normal" manner as described in the Silvicultural Ground Rules, or with specific modifications)?"

The answer to the second question may be any of the following:

- specific access provisions are necessary to protect the identified resource features, land uses or values, which could mean precise locations (i.e. maximum 100 m width) for required primary and secondary access roads, use management strategies, and/or conditions on tertiary access roads;
- normal operations can be carried out and still protect the identified resource features, land uses or values; or
- modifications to normal operations are required to protect the identified resource features, land uses or values.

It is recognized that it may not often be possible to answer the initial question without addressing the second question, in that a

decision on whether or not operations can be carried out may be largely dependent on how they can proceed. In addition, there may be situations in which the answer to the initial question may be that timber management operations will proceed, even though complete protection of the identified resource features, land uses or values may not be ensured. In such situations, justification for decisions to proceed with operations must be produced, and the question of how they can proceed (i.e. the second question) must be answered.

It is also recognized that, for any individual area of concern, the product of the comprehensive planning process will not normally be a decision on only one of the four basic operational options (i.e. reserve, specific access provisions, normal operations or modified operations). Rather, the planning process will commonly involve consideration and analysis of various combinations of those options, with ultimate decisions on:

- an acceptable option or combination of options;
- a precise location and associated use management strategy for each required primary and secondary access road, and conditions on tertiary access roads;
- delineation of those portions of the area of concern in which a reserve is required;
- delineation of those portions of the area of concern in which normal operations can be carried out; and
- a suitable modified management prescription for those portions of the area of concern in which modified operations are required.

Part of the comprehensive planning process for specific areas of concern involves the development of a compliance monitoring program (Refer to PART THREE, Section 2.2.2). For each area of concern, if specific access provisions or modified management prescriptions are prescribed, a program of monitoring compliance with those provisions and prescriptions during and after the implementation of

operations is determined during the preparation of the Timber Management Plan.

The following discussion provides additional details of the planning requirements and resultant products of the planning process for each of:

- (a) harvest, renewal and/or tending operations; and
- (b) access roads.

(V) (a) Harvest, Renewal and Tending Operations

In the planning of harvest, renewal and tending operations for individual areas of concern, or types of associated areas of concern, it may be determined that normal operations can be carried out and still protect the identified resource features, land uses or values. In such cases, no further detailed planning is undertaken; the area of concern, or a part thereof, becomes part of the adjacent area of operations to which the Silvicultural Ground Rules will apply (i.e. the "normal operating areas"). In such situations, justification for decisions to proceed with normal operations must be produced.

If, however, it is determined that modifications to normal operations are required to protect the other identified resource features, land uses or values, a detailed planning procedure must be followed, as described in APPENDIX I. That planning procedure requires:

- consideration of alternative modified management prescriptions for harvest, renewal and/or tending operations, normally as alternative combinations of the required operations;
- a comprehensive evaluation and comparison of the potential environmental effects of the alternative modified management prescriptions; and

- the ultimate selection of a preferred/most acceptable modified management prescription.

The results of the analysis of the alternatives provide the basis, and supporting rationale, for the selection of the preferred/most acceptable modified management prescription for the individual area of concern, or type of associated areas of concern.

As discussed in PART THREE, Chapter 1, MNR has produced a number of guidelines for timber management operations in various types of areas of concern. These guidelines provide information on alternative modified management prescriptions which could be employed to protect particular resource features, land uses or values. Application of three provincial guidelines, which address the protection of fisheries habitat, moose habitat and areas of tourism value, is mandatory in the timber management planning process. In addition, MNR's Silvicultural Guides (Refer to PART THREE, Chapter 1) serve as additional sources of information for the determination of prescriptions for various types of areas of concern.

(V) (b) Access

Planning of access roads which are required during the five-year term involves:

- the second stage of planning of locations for primary access roads;
- planning of locations for secondary access roads, which normally provide access within areas selected for operations;
- development of "use management strategies" for each primary and secondary access road; and
- determination of any necessary conditions on locations, construction and use of tertiary access roads.

For those portions of primary and secondary access roads which

traverse specific areas of concern, precise road locations
(i.e. maximum 100 m width) must be determined in accordance with
the detailed planning procedure described in APPENDIX II. That
planning procedure requires:

- consideration of alternative precise road locations
(i.e. maximum 100 m width) for each required road within
each specific area of concern;
- a comprehensive evaluation and comparison of the potential
environmental effects of those alternative precise road
locations; and
- the ultimate selection of a preferred/most acceptable
location for each required road.

The results of the analysis of the alternatives provide the basis,
and the supporting rationale, for the selection of the
preferred/most acceptable road location.

In addition, there are planning requirements for tertiary access
roads within specific areas of concern for the five-year term.

Those planning requirements do not require the determination of
precise locations for required tertiary access roads, but rather
focus on the identification of:

- portions of the specific area of concern in which no
tertiary access roads will be permitted; and/or
- portions of the specific area of concern in which special
practices are required, such as special construction
practices, specified seasons of use (e.g. winter only),
mechanisms to control use, and immediate removal upon
completion of timber management activities.

In normal operating areas, the general location of each primary
access road which was previously established for the 20-year period
of the Timber Management Plan (i.e. a corridor of approximately
1 km width) is refined to a corridor of approximately 500 m width
for that portion of the primary access road which is required
during the five-year term. That refinement will involve

consideration of specific areas of concern which have been
identified within the previously-established 1 km wide corridor, by
avoiding those areas.

For those portions of secondary access roads in normal operating
areas, general road locations (i.e. corridors of 500 m width) are
also determined. The determination of those road corridor
locations will involve consideration of specific areas of concern
by avoiding those areas.

For secondary access roads, the determination of an alignment for
the total length of each road which will be constructed during the
five-year term requires consideration of alternative total
alignments. Each alignment would comprise a corridor of
approximately 500 m width in normal operating areas, and a precise
location (i.e. maximum 100 m width) within specific areas of
concern. Similar to the analysis of alternative corridors for
primary access roads for the 20-year period of the Timber
Management Plan, an analysis of alternative total alignments for
each required secondary access road provides the basis, and
supporting rationale, for the selection of a preferred/most
acceptable total alignment. That analysis includes an
environmental evaluation and comparison of alternative total
alignments, and consideration of use management strategies.
For each new primary and secondary access road, a "use management
strategy" is also developed. The strategy will be based primarily
on requirements for the protection of other resource features, land
uses or values in those specific areas of concern traversed by,
and/or in the vicinity of, the particular road. Various options
for managing the use of access roads must be considered
(e.g. road closure under the authority of The Public Lands Act,
restrictions to specific classes of vehicles, non-maintenance or
abandonment after the intended use of the road has been fulfilled).
The procedure for the determination of use management strategies is
outlined in MNR's "Resource Access Roads Policy and Implementation
Strategies and Guidelines"⁹.

2.1.3 Public Consultation and *The Plan* Review and Approval Process

2.1.3.1 General

Formal opportunities for the participation of other government ministries and agencies, municipalities, interest groups, local native communities and individual members of the public are provided at various stages in the timber management planning process. These opportunities for public consultation are integrated into a comprehensive schedule for the production, review and approval of a Timber Management Plan and represent minimum requirements which must be met. Additional opportunities may be provided if the need arises during the planning process. For each of the formal opportunities which is provided, specific notice will always be given to the Band Council of each Indian Reserve in the forest management unit, and any other native communities and organizations which are potentially affected.

All public consultation activities in the preparation of a Timber Management Plan will be co-ordinated through the MNR District office. MNR's Regional Offices or Main Office will provide annually a list of all plans to be prepared during that year to any interested external participants who request this information. Those participants will be directed to the appropriate MNR District office for any future involvement in the preparation of a Timber Management Plan for a specific management unit.

2.1.3.2 Responsibilities

MNR is responsible for all aspects of the public consultation program in the preparation of Timber Management Plans for Crown Management Units. In the preparation of plans for Company Management Units and Forest Management Agreement Forests (FMAs), MNR and the particular forest company involved share the

responsibility. MNR assumes the lead role for ensuring that all formal opportunities for public consultation are provided (i.e. issuance of public notices and provision of facilities for public reviews). The forest company participates in all stages of public consultation and is responsible for ensuring that all comments and submissions from interested participants are considered in the preparation of the Timber Management Plan.

2.1.3.3 Production, Review and Approval of a Timber Management Plan

FIGURE 2.1-2 outlines the generic schedule for the production, review and approval of a Timber Management Plan. The schedule normally covers a 12 to 15 - month period, providing:

- a six to nine-month period for production of a draft Timber Management Plan; and
- a six-month period for the formal review and approval process.

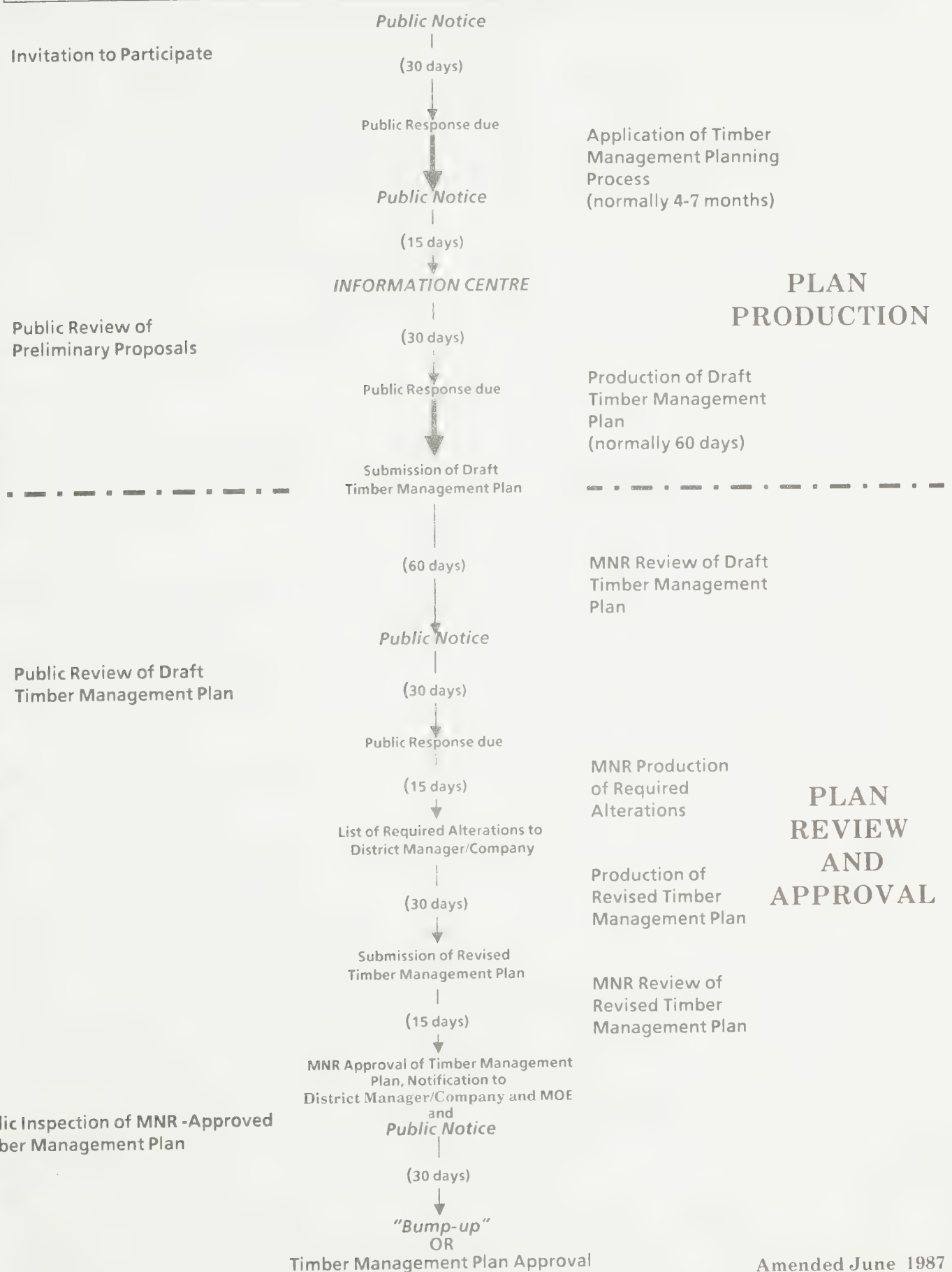
The schedule provides time periods for each step in the formal review and approval process, and for responses from interested external participants for each public consultation opportunity.

The five-year term of application of the Timber Management Plan normally commences on the first day of April of the year in which a new approved plan must be in place. The schedule, therefore, requires submission of a draft Timber Management Plan six months prior to that due date to provide for the minimum requirements of the formal review and approval process. If the MNR planning team or individual company responsible for the preparation of the Timber Management Plan desires to provide additional time for the formal review and approval process, or for public consultation, the specific schedule which must be produced at the commencement of the planning process must ensure that the draft Timber Management Plan is submitted at an earlier date.

Figure 2.1-2

Schedule: Timber Management Plan Production, Review and Approval

Public Consultation Phase	Schedule	Stages in Plan Production, Review and Approval
---------------------------	----------	--



Four formal opportunities are provided for public consultation in the preparation of the Timber Management Plan:

- an INVITATION TO PARTICIPATE, at the outset of the timber management planning exercise;
- an opportunity to REVIEW preliminary proposals at an INFORMATION CENTRE, prior to production of the draft Timber Management Plan;
- an opportunity to REVIEW the draft Timber Management Plan; and
- an opportunity for INSPECTION of the approved Timber Management Plan.

A description of each of the formal opportunities for public consultation is presented in the following discussion of the schedule for the production, review and approval of a Timber Management Plan.

INVITATION TO PARTICIPATE - At the commencement of the preparation of the Timber Management Plan, the MNR District Manager will issue a public notice announcing that a Timber Management Plan will be prepared for the management unit, and inviting interested external participants to become involved in the planning process.

The public notice will normally be in the form of:

- direct written invitations to local and regional offices of relevant government ministries or agencies, municipalities, interest groups, *Band Councils of each Indian Reserve in the forest management unit, native communities and organizations*, and individual members of the public with a known interest in timber management planning for the management unit; and
- general public notices, usually in the form of paid public advertisements in the local media, advising the general public of the opportunity to become involved.

Direct verbal communication may serve as an *additional* form of notification, where appropriate.

The public notice will include:

- a map of the management unit for which the Timber Management Plan will be prepared;
- a summary of the schedule of the planning process; and
- an outline of the subject matter to be covered by the plan (normally the harvest, renewal and maintenance operations, consideration of concerns of other users/uses of the forest, and the locations of roads).

The public notice will invite interested participants to offer comments on any aspect of the upcoming plan, and will specifically direct their attention to:

- providing additional background information on the management unit;
- identifying areas which contain *resource features, land uses or values* that might be affected by timber management operations; and
- stating issues or concerns which need to be addressed during the planning process.

A period of thirty (30) days is provided for interested participants to respond to the INVITATION TO PARTICIPATE.

PUBLIC REVIEW - INFORMATION CENTRE - Prior to the production of a draft Timber Management Plan, the District Manager will issue a second public notice, inviting interested external participants to an INFORMATION CENTRE to review, and comment on, alternatives and preliminary proposals which have been developed. This public notice will normally be issued four to five months after the initial INVITATION TO PARTICIPATE, and must be issued at least *twenty-one* (21) days in advance of the date of the INFORMATION CENTRE.

The public notice will normally be in the form of:

- direct written invitations to all parties/persons who received a written INVITATION TO PARTICIPATE, and any other parties/persons who have declared an interest since the initial public notice; and
- general public notices, usually in the form of paid public advertisements in the local media, advising the general public of the opportunity to review preliminary proposals at the INFORMATION CENTRE.

Direct verbal communication may serve as an *additional* form of notification, where appropriate.

This second public notice will include the same descriptive material as the initial INVITATION TO PARTICIPATE, and will inform interested participants that the INFORMATION CENTRE provides an opportunity to review, and comment on, the alternatives and preliminary proposals which have been developed, before decisions are made.

At the INFORMATION CENTRE, members of the MNR planning team will be present to explain developments in the planning process and respond to any inquiries. For company-prepared Timber Management Plans, developments in the planning process will be explained primarily by company staff, with MNR staff available in a support role.

Although a broad array of information will be provided at the INFORMATION CENTRE in the form of maps, displays and written material, the following information must be available, and is expected to be the principal focus of attention:

- *a "values map" for the management unit which displays known resource features, land uses and values which must be considered in the planning process;*
- *draft objectives and strategies for the management of the*

- timber resource of the management unit; 1
- maps which identify areas eligible for operations for the 20-year period of the plan, and the specific areas of operations for the five-year term; 2 3 4
- maps which identify specific areas of concern to other MNR program groups and other Crown land resource users; 5 6
- maps which identify alternatives, and preliminary proposals, for: 7 8 9
 - broad corridors for primary access roads for the 20-year period of the plan; and 10 11
 - more precise locations of primary and secondary access roads required during the five-year term; 12 13 14
- the analysis of the alternative access road locations; and 15
- the analysis of, and preliminary proposals for, operations within specific areas of concern. 16 17 18

The minimum requirement for the INFORMATION CENTRE is a one-day opportunity at a convenient location. A period of thirty (30) days after the date of the INFORMATION CENTRE is provided for interested participants to present submissions regarding concerns with the preliminary proposals for the draft Timber Management Plan. 19 20 21 22 23 24

It is recognized that all interested participants may not be able to attend the INFORMATION CENTRE. Therefore, the preliminary proposals for the draft Timber Management Plan will be available for public review at the MNR District office for a period of thirty (30) days after the date of the INFORMATION CENTRE. Members of the MNR planning team will be available to explain developments in the timber management planning process and respond to any inquiries. 25 26 27 28 29 30 31 32

It is also recognized that additional areas of concern may be identified by interested participants during this stage of public consultation. If necessary, additional opportunities will be provided for those participants to review and comment on 33 34 35 36

alternatives, and preliminary proposals, for road locations and/or operations within those areas of concern, prior to production of the draft Timber Management Plan.

PRODUCTION AND SUBMISSION OF THE DRAFT TIMBER MANAGEMENT PLAN -

After the thirty (30)-day review period, the draft Timber Management Plan will be produced and submitted for *formal* review and approval. The due date for submission of the draft Timber Management Plan has been previously established in the specific schedule for the production of the plan, which normally provides a period of sixty (60) days for plan production.

Upon submission, the draft Timber Management Plan must be accompanied by supplementary documentation which describes the submissions which were received during public consultation and how they have been considered in the preparation of the draft plan. The supplementary documentation will also address the application of the comprehensive planning requirements for:

- access roads, and
- operations in specific areas of concern.

MNR REVIEW OF DRAFT TIMBER MANAGEMENT PLAN - Upon submission of the draft Timber Management Plan and accompanying supplementary documentation, MNR will undertake an internal review by the District, Region and Forest Resources Group, Main Office over a period of normally sixty (60) days. This review could be favourable, recommending approval of the draft plan as submitted, or unfavourable, culminating in a preliminary list of required alterations and the reasons for them.

During the sixty (60)-day review period, for MNR-prepared plans the District Manager may direct, and for company-prepared plans the particular forest company involved may undertake, immediate alterations to the draft Timber Management Plan to address some or all of the preliminary list of required alterations, if any.

The end-result of the MNR review of the draft Timber Management Plan is the production of a preliminary list of outstanding required alterations, if any. The Director, Timber Sales Branch, Forest Resources Group, Main Office will forward this list to the District Manager, and for company-prepared plans, to the particular forest company involved.

PUBLIC REVIEW OF DRAFT TIMBER MANAGEMENT PLAN - Upon completion of the MNR internal review of the draft Timber Management Plan and accompanying supplementary documentation, the District Manager will issue a public notice inviting interested external participants to review the draft plan, supplementary documentation, and MNR's preliminary list of *outstanding* required alterations, if any. This public review will take place prior to approval of the draft plan or, if required, production of a revised plan.

The public notice will *normally* be in the form of:

- direct written invitations to all respondents to the initial INVITATION TO PARTICIPATE, and all visitors to the INFORMATION CENTRE; and
- general public notices, usually in the form of paid public advertisements in the local media, advising the general public of the opportunity to review the draft Timber Management Plan, accompanying supplementary documentation, and MNR's preliminary list of *outstanding* required alterations, if any.

Direct verbal communication may serve as an *additional* form of notification, where appropriate.

The public notice will inform interested participants that the draft Timber Management Plan is available for review. That opportunity to review the draft plan will enable participants:

- to review how their earlier comments and submissions have been considered in the preparation of the draft Timber

Management Plan;

- to comment on decisions which have been made; and
- to review, and comment on, MNR's preliminary list of outstanding required alterations, if any.

A copy of the draft Timber Management Plan and accompanying supplementary documentation will be provided to the Environmental Assessment Branch, Ministry of the Environment for their public record files.

A period of thirty (30) days after the date of the public notice is provided for interested participants to review the draft Timber Management Plan, to present comments and submissions regarding MNR's preliminary list of outstanding required alterations, if any, and to suggest additional alterations.

After the thirty (30)-day review period, MNR will consider the submissions, and:

- (i) if no significant concerns are expressed or if concerns identified in the submissions cannot be accommodated, and MNR's internal review resulted in a recommendation to approve the draft plan as submitted, no alterations to the draft plan will be required;
- (ii) if no significant concerns are expressed or if concerns identified in the submissions cannot be accommodated, and MNR's internal review resulted in a preliminary list of outstanding required alterations, that preliminary list will be considered to be the final list of required alterations; or
- (iii) if possible, MNR will incorporate suggested alterations from interested participants into the

final list of required alterations to the draft
plan.

In the first case, the draft plan will then be approved jointly by the Director, Timber Sales Branch and the Regional Director. The Director, Timber Sales Branch will notify the District Manager, and for company-prepared plans, the particular forest company involved, of the MNR approval of the Timber Management Plan. Final approval of the Timber Management Plan for implementation is subject to a thirty (30)-day public inspection period. This period provides a final opportunity for interested participants to request a "Bump-up" of the Timber Management Plan, or a component part of the Timber Management Plan, to individual environmental assessment status (Refer to PART TWO, Section 2.3).

In the second case, the Director, Timber Sales Branch will notify the District Manager, and for company-prepared plans, the particular forest company involved, that the preliminary list of outstanding required alterations will be considered to be the final list of required alterations. That notification will normally be forwarded within fifteen (15) days of the final date for presentation of public submissions on the draft Timber Management Plan.

In the third case, the final list of required alterations will be produced jointly by the MNR District, Region and Forest Resources Group, Main Office. The Director, Timber Sales Branch will forward this list to the District Manager, and for company-prepared plans, to the particular forest company involved. That final list of required alterations will normally be forwarded within fifteen (15) days of the final date for presentation of public submissions on the draft Timber Management Plan.

PRODUCTION AND MNR REVIEW OF REVISED TIMBER MANAGEMENT PLAN - If alterations to the draft Timber Management Plan are required, a revised Timber Management Plan will be produced and submitted for

formal review and approval, accompanied by the required
 supplementary documentation. Normally, a period of thirty (30) days
 is provided for production of the revised Timber Management Plan,
 although the previously-established specific schedule for the
 production of the plan may have provided additional time.
 Upon submission of the revised Timber Management Plan and
 accompanying supplementary documentation, MNR will undertake an
 immediate internal review (by the District, Region and Forest
 Resources Group, Main Office) to ensure that the required
 alterations have been made. If the required alterations have been
 satisfactorily incorporated, the revised plan will be approved
 jointly by the Director, Timber Sales Branch and the Regional
 Director, normally within fifteen (15) days of the submission of
 the revised plan. The Director, Timber Sales Branch will notify
 the District Manager, and for company-prepared plans, the
 particular forest company involved, of the MNR approval of the
 Timber Management Plan. Final approval of the Timber Management
 Plan for implementation is subject to a thirty (30)-day public
 inspection period. This period provides a final opportunity for
 interested participants to request a "Bump-up" of the Timber
 Management Plan, or a component part of the Timber Management Plan,
 to individual environmental assessment status (Refer to PART TWO,
 Section 2.3).

NOTIFICATION TO MINISTRY OF THE ENVIRONMENT - Upon approval of the
 Timber Management Plan by MNR senior management, the Director,
 Timber Sales Branch will notify the Environmental Assessment
 Branch, Ministry of the Environment, and will submit a copy of the
 MNR-approved plan and accompanying supplementary documentation for
 their public record files.

PUBLIC INSPECTION OF THE APPROVED TIMBER MANAGEMENT PLAN - At the
 same time as the Ministry of the Environment is notified, the
 District Manager will issue a public notice advising interested
 external participants that the MNR-approved plan is available for
 inspection.

The public notice will normally be in the form of:

- direct written notices to all previously identified participants, and all parties/persons known to be directly affected by timber management operations during the next five-year term; and
- general public notices, usually in the form of paid public advertisements in the local media, advising the general public of the opportunity for inspection of the MNR-approved plan.

Direct verbal communication may serve as an *additional* form of notification, where appropriate.

The public notice will clearly indicate that the opportunity for inspection of the MNR-approved Timber Management Plan provides a final opportunity for interested participants to request a **"Bump-up"** of the Timber Management Plan, or a component part of the Timber Management Plan, to individual environmental assessment status (Refer to PART TWO, Section 2.3). A thirty (30)-day period after the date of the public notice is provided for interested participants to pursue such a request. If a request is not received during that period, the MNR-approved Timber Management Plan automatically receives final approval *for implementation*. The final approved Timber Management Plan will remain available for public inspection at the MNR District office at any time during its five-year term.

2.1.4 Documentation

2.1.4.1 The Timber Management Plan

MNR's "Timber Management Planning Manual for Crown Lands in Ontario"¹ outlines the format and content requirements for the documentation of the results of the timber management planning process in a Timber Management Plan. These requirements, as set out

in Chapter 4 of the manual, represent the minimum content
 requirements for an acceptable Timber Management Plan, whether
 produced by MNR or a forest company.

With reference to FIGURE 2.1-1 and the description of the timber
 management planning process in PART TWO, Section 2.1.2, the
 following documentation requirements are principal components of a
 Timber Management Plan:

- the Report of Past Forest Operations (text, tables and
 appendices (detailed tables));
- the objectives and strategies for management of the
 timber resource of the management unit (text);
- the Silvicultural Ground Rules (text and tables);
- the Maximum Allowable Depletion (text, tables and
 appendices (detailed tables));
- the areas eligible for harvest, renewal and maintenance
 operations (text (criteria), maps and appendices
 (detailed maps));
- preliminary areas of concern (appendices (detailed
 maps));
- the primary access system (text, maps and appendices
 (detailed maps));
- the planned harvest and renewal and maintenance program
 (text and tables);
- the areas selected for harvest, renewal and maintenance
 operations (text (criteria), maps and appendices
 (detailed maps and tables));
- specific areas of concern (appendices (maps));
- operational prescriptions for specific areas of concern
 (tables and appendices (detailed maps and tables)); and
- primary and secondary access road locations (text,
 maps, tables and appendices (detailed maps and
 tables)).

2.1.4.2 Supplementary Documentation

The planning manual also sets out requirements for supplementary documentation which must accompany the Timber Management Plan through the formal review and approval process. That supplementary documentation will address public consultation in the preparation of the Timber Management Plan, and the application of the comprehensive planning requirements for:

- access roads, and
- *operations in specific areas of concern.*

Supplementary documentation of public consultation in the preparation of the Timber Management Plan will include:

- records of all public notices which were issued, and all comments and submissions which were received from interested external participants; and
- a summary of how those comments and submissions were considered, and where possible, incorporated in the preparation of the plan.

Supplementary documentation of the comprehensive planning requirements for individual access roads will include:

- a map which identifies the alternatives which were considered;
- a summary of the environmental evaluation and comparison of the alternatives;
- a summary of comments and submissions which were received from interested external participants; and
- the rationale for the selection of the preferred/most acceptable alternative, including the consideration of comments and submissions from interested participants in the selection.
- *a description of the compliance monitoring program*

which will be undertaken.

This supplementary documentation must be produced for each primary access road corridor required for the 20-year period of the Timber Management Plan, and each primary and secondary access road required during the five-year term.

Supplementary documentation of the comprehensive planning requirements for operations within specific areas of concern will include:

- a map which identifies the specific areas of concern within the areas selected for operations during the five-year term, and an accompanying description of the resource features, land uses or values which require protection in each area;*
- the operational options which were considered for each individual area of concern, or each type of associated areas of concern, including alternative modified management prescriptions, where applicable;*
- a summary of the environmental evaluation and comparison of the alternative modified management prescriptions, where applicable;*
- a summary of comments and submissions which were received from interested external participants; and*
- the rationale for the selection of the operational option(s) and, where applicable, the preferred/most acceptable modified management prescription(s), including the consideration of comments and submissions from interested participants in the selection; and*
- a description of the compliance monitoring program which will be undertaken.*

2.1.5 Plan Renewal and Amendment

2.1.5.1 Plan Renewal

A new Timber Management Plan is produced for each management unit at the end of the five-year term. This scheduled renewal permits a regular review of the long-term direction of the plan, and provides the opportunity to assess past performance and the flexibility to accommodate changes in circumstances, such as changes in the land base and forecasts of wood requirements.

An unscheduled renewal of the Timber Management Plan may also be required if the plan is rendered obsolete at any time during its five-year term. Any major natural disturbance or change in circumstances which would cause the management objectives for the management unit to become unattainable, or the management strategies to become inappropriate, would require the production of a new Timber Management Plan. The reasons for the unscheduled renewal of the Timber Management Plan must be documented in the new plan. For example, a large forest fire or insect infestation could require significant changes to the Timber Management Plan, requiring the selection of new areas of operations, and consequently, the determination of the operations which will be carried out in those new areas of operations.

(NOTE: If an unscheduled renewal of the Timber Management Plan is required, there may be sufficient approved operations in the original Timber Management Plan to permit operations to proceed during the period of time required to produce, review and approve the new plan. If the availability of approved operations is insufficient, a "contingency plan" (Refer to PART TWO, Section 2.4.2) will be produced to allow operations to proceed.)

Production of a new Timber Management Plan, whether as a scheduled or unscheduled renewal, requires:

- application of the entire timber management planning process, as described in PART TWO, Section 2.1.2;
- provision of all formal opportunities for public consultation, and application of the complete MNR review and approval process, as described in PART TWO, Section 2.1.3; and
- production of the Timber Management Plan and accompanying supplementary documentation in accordance with the documentation requirements described in PART TWO, Section 2.1.4.

* PARAGRAPH DELETED *

2.1.5.2 Plan Amendment

Amendments to the approved Timber Management Plan may be required at any time during its five-year term to permit changes which do not alter the intent of the plan (i.e. the management objectives and strategies remain the same, but specifics related to their achievement require alterations). For example, amendments may be required to permit changes in operational prescriptions because new information has been obtained; to permit new operations which are required in response to unforeseen circumstances (e.g. salvage harvest operations in areas disturbed by forest fires); or to resolve outstanding matters which were deferred during the preparation, review and approval of the Timber Management Plan.

Appropriate mechanisms are required to process amendments to approved Timber Management Plans, frequently in an expeditious manner. Those amendments could range from simple corrections to the text of an approved Timber Management Plan to substantial alterations which require comprehensive planning, including opportunities for public consultation. Therefore, three categories of amendments are provided: administrative, minor and major. For any amendment, the planning requirements will depend on the nature of the proposed operations, but will involve the same

technical planning requirements as would be required if the operations were proposed in the preparation of a new Timber Management Plan. However, the MNR review and approval requirements, and the opportunities for public consultation, will differ depending upon the category of the amendment.

If a forest company, MNR management unit forester, or any other party wishes to amend the approved Timber Management Plan, a request for an amendment must initially be submitted to the District Manager. Documentation of the requirement for, and nature of, the proposed amendment must accompany the request. The District Manager directs a technical analysis of the requested amendment by the MNR planning team. On the basis of the documentation which accompanied the amendment request, and the results of the technical analysis, the District Manager must determine:

- (i) whether the request for an amendment should be permitted to proceed, and
- (ii) the appropriate category of amendment.

In the determination of the District Manager's response to these two considerations, a number of factors are normally considered, including the following fundamental questions:

- Is there adequate justification of the requirement for the amendment?
- Would the intent of the previously-approved Timber Management Plan be changed?
- Are there legitimate time constraints (i.e. urgency) which must be met for reasons of:
 - (a) public safety (e.g. a blowdown situation and inherent fire hazard);
 - (b) biological necessity (e.g. salvage of fire-killed or dying timber which may quickly lose product

quality because of insect damage); or 1
 (c) public convenience and necessity (e.g. to keep 2
 people employed)? 3

- Has there been previous notification that the requested 5
 amendment will be required (i.e. an outstanding matter 6
 for which a decision was deferred in the approved 7
 Timber Management Plan)? 8
- What is the frequency of similar requests for 9
 amendments to the approved Timber Management Plan? 10
- Is there sufficient information on the resource 11
 features, land uses and values which are potentially 12
 affected? 13
- What are the anticipated potential effects (positive 14
 and negative) on other MNR program groups, other Crown 15
 land resource users and the environment? 16
- Is the requested amendment a response to the product of 17
 another planning exercise, which included public 18
 consultation (e.g. a required change to an approved 19
 Timber Management Plan as a result of the annual 20
 planning requirements for insect/disease pest control 21
or a withdrawal of land from the land base of the 22
 management unit for some other use)? 23

If the District Manager decides that the request for an amendment 25
 should not proceed, the amendment requestor will be notified of the 26
 rejection of the amendment request, with reasons. 27

If the District Manager decides that the request for an amendment 29
 should proceed, the appropriate category of amendment must be 30
 determined. Essentially, the District Manager must decide whether 31
 the proposed operations which are the subject of the amendment 32
 request, and their possible ramifications, are such that: 33

- (i) opportunities must be provided for public consultation 35
 in the preparation and review of the proposed amendment 36

- (i.e. major amendment); 1
- (ii) an opportunity must be provided for public review of 2
the proposed amendment, prior to MNR approval 3
- (i.e. minor amendment); or 4
- (iii) MNR can simply approve the proposed amendment 5
(i.e. administrative amendment). 6

For each of the three categories of amendments, the planning, 8
review and approval procedures which will apply are described in 9
APPENDIX XI. Those procedures also include formal documentation 10
requirements, provisions for public consultation, and requirements 11
for notification to the Environmental Assessment Branch, Ministry 12
of the Environment. 13

2.2 The Annual Work Schedule 15

2.2.1 General 17

An Annual Work Schedule is produced each year to guide the actual 19
implementation of timber management operations. The Annual Work 20
Schedule is normally prepared for a 12-month period which normally 21
commences on the first day of April of each year, and must be 22
approved by the MNR District Manager before operations can proceed. 23
Responsibility for the preparation of the Annual Work Schedule 24
rests with the MNR Management Unit Forester or, for 25
company-prepared schedules, the Company Forester. 26

The Annual Work Schedule is not a plan, but is simply a schedule 28
for the implementation of operations. The Annual Work Schedule 29
selects, from the planned operations for the five-year term of the 30
Timber Management Plan, those timber management operations which 31
will be carried out during a 12-month period. The Annual Work 32
Schedule provides the necessary link between the Timber Management 33
Plan and the government (or company) annual work planning and 34
budget allocation process which makes personnel and financial 35
resources available to carry out the planned operations. 36

2.2.2 Contents of the Annual Work Schedule

The Annual Work Schedule describes the operations which will be carried out during the next 12-month period, as previously determined in the *Timber Management Plan*. The description of operations will include:

- the access roads which will be constructed; and
- the harvest, renewal and tending operations which will be carried out.

In addition, the Annual Work Schedule will describe the protection (i.e. insect/disease pest control) operations, if any, which will be carried out in areas which were selected for protection in the application of the annual planning procedure for protection operations (Refer to APPENDIX III).

MNR's "Timber Management Planning Manual for Crown Lands in Ontario"¹ outlines the format and content requirements for the Annual Work Schedule. These requirements, as set out in Chapter 5 of the manual, represent the minimum content requirements for an acceptable Annual Work Schedule, whether produced by MNR or an individual forest company.

2.2.3 MNR's Review and Approval Process

A draft Annual Work Schedule must be produced and submitted for MNR review and approval at least two months prior to its 12-month term of application, which normally commences on the first day of April of each year. (For Forest Management Agreement Forests (FMAs), all *Forest Management Agreements* require that a draft Annual Work Schedule must be submitted by November 30 of the previous year.)

Upon submission of the draft Annual Work Schedule, MNR will undertake an internal review by the District over a period of normally thirty (30) days. This review could be favorable,

recommending approval of the draft Annual Work Schedule as submitted, or unfavorable, culminating in a list of required alterations, and the reasons for them. The District Manager will forward this list to the *District Forest Management* Supervisor, or for company-prepared schedules, to the particular forest company involved.

If the draft Annual Work Schedule is consistent with the approved Timber Management Plan, and MNR's internal review recommends its approval, the draft schedule will then be approved *for implementation* by the District Manager.

If alterations to the draft Annual Work Schedule are required, a period of normally thirty (30) days is provided for production of the revised Annual Work Schedule which is submitted for MNR review and approval. Upon submission of the revised Annual Work Schedule, MNR will undertake an immediate internal review by the District to ensure that the required alterations have been made. If the required alterations have been satisfactorily incorporated, the revised Annual Work Schedule will be approved *for implementation* by the District Manager, normally within a few days of the submission of the revised schedule.

(NOTE: For the five-year term of the Timber Management Plan, MNR's review and approval process for the first Annual Work Schedule will necessarily overlap with the latter stages of MNR's review and approval process for the Timber Management Plan. Approval of that first Annual Work Schedule cannot be granted by the District Manager until the Timber Management Plan has received final approval.)

2.2.4 Public Inspection

Upon approval of the Annual Work Schedule, the District Manager will issue a public notice advising interested external parties/persons that the approved Annual Work Schedule is available

for inspection at the MNR District office.

The public notice will normally be in the form of:

- direct written notices to all parties/persons known to be directly affected by timber management operations during the next 12-month period; and
- general public notices, usually in the form of paid public advertisements in the local media, advising the general public of the opportunity for inspection of the approved Annual Work Schedule.

Direct verbal communication may serve as an *additional* form of notification, where appropriate.

The approved Annual Work Schedule will remain available for public inspection at the MNR District office at any time during its 12-month term of application.

(NOTE: As normal MNR procedure, during the 12-month term of the Annual Work Schedule, the District Manager will also issue a public notice at least thirty (30) days prior to the anticipated date of any aerial application of any pesticide on the management unit for timber management purposes. During that period, the approved project descriptions for any site preparation, tending or protection operations which involve the aerial application of pesticides will be available for public inspection at the MNR District office. *The same public notice will be issued again seven (7) days prior to the anticipated date of application.*

Each of these public notices will normally be in the form of paid public advertisements in the local media, advising all interested and potentially affected parties/persons, and the general public, that the projects will soon be implemented, and offering the opportunity for inspection of the approved

project descriptions at the MNR District office.)

2.2.5 Other Approvals

Prior to the commencement of the operations set out in the approved Annual Work Schedule, appropriate authorizing documents are required from MNR and, in some cases, other government ministries/agencies. The MNR authorizing documents provide the authority to conduct specific operations, and assist in MNR's record-keeping for the purpose of monitoring compliance with approved Timber Management Plans and Annual Work Schedules. A list of MNR's authorizing documents is presented in APPENDIX X.

2.2.6 Amendments

Amendments to the approved Annual Work Schedule may be made during its 12- month term of application, provided that the amendments are consistent with the Timber Management Plan. Documentation of the requirement for, and nature of, any proposed amendment must be submitted to the District Manager for approval, and the approved amendment must be appended to the previously-approved Annual Work Schedule. No further public notices will be issued for amendments to the approved Annual Work Schedule. Rather, the annual public notice advising interested external parties/persons that the approved Annual Work Schedule is available for inspection at the MNR District office at any time during its 12- month term of application will also indicate that any future amendments to the approved Annual Work Schedule will be available for inspection.

2.3 "Bump-up" Provisions

In the preparation of a Timber Management Plan, or a major amendment to a previously-approved plan, the proposed timber management operations may cause significant public controversy or may be perceived to cause significant adverse environmental impacts. For such plans or major amendments, the planning

provisions of this Class Environmental Assessment may be unable to satisfactorily resolve the concerns, and special planning requirements may be necessary.

Therefore, within the timber management planning process, a mechanism is provided for elevating a Timber Management Plan, a component part of a Timber Management Plan (e.g. a primary or secondary access road, or the operational prescription(s) for a specific area of concern), or a major amendment to a previously-approved plan, from the Class Environmental Assessment to individual environment assessment status. The result would be that an individual environmental assessment for a specific plan, a component part of a plan, or a major amendment would have to be prepared and submitted for formal review and approval under The Environmental Assessment Act, including the possibility of a formal public hearing. This act of elevating a plan, a component part of a plan, or a major amendment to individual environmental Assessment status is called "Bump-up".

Provision of opportunities for interested parties/persons to request a "Bump-up" is incorporated in the timber management planning process for the Timber Management Plan, any renewal of the plan (whether scheduled or unscheduled), and any major amendment to a previously-approved plan. The "Bump-up" procedure may be initiated at any time during the timber management planning process, with a final opportunity within thirty (30) days of the public notice advising interested participants that the MNR-approved plan or major amendment is available for inspection at the MNR District office. *If a request is not received during that period, the MNR-approved Timber Management Plan or major amendment automatically receives final approval for implementation.*

It is expected, however, that any interested party/person with a concern would bring this concern to MNR's attention early in the timber management planning process when MNR has maximum flexibility to deal with the concern.

The procedure for submission of a "Bump-up" request is as follows:

1. A party (e.g. government ministry or agency, interest group) or person with a concern would bring that concern to MNR's attention.
2. If the concern is not resolved through discussions with MNR, MNR could voluntarily prepare an individual environmental assessment for the particular Timber Management Plan, a component part of the plan, or a major amendment to a previously-approved plan, OR the party/person could request that MNR initiate a "Bump-up".

3. If MNR refuses and the party/person with the concern wishes to pursue the "Bump-up" request, the party/person may request the Minister of the Environment to direct MNR to undertake an individual environmental assessment for that Timber Management Plan, a component part of the plan, or a major amendment to a previously-approved plan. Any such request must be submitted in writing, with accompanying reasons for the request.

If a "Bump-up" request is initiated during the preparation of the Timber Management Plan or major amendment, the production, review and approval of the plan or major amendment may proceed while the Minister of the Environment considers the request.

If a "Bump-up" request is initiated during the thirty (30)-day period for public inspection of the MNR-approved Timber Management Plan or major amendment, operations which are set out in that plan or major amendment cannot proceed until the Minister of the Environment has made a decision on the request.

4. The Minister of the Environment considers the "Bump-up"

request, and provides an opportunity for the Minister of
Natural Resources to respond to the request before he makes
a decision. That decision will normally be made within
forty-five (45) days of the submission of the "Bump-up"
request.

If the Minister of the Environment does not agree to the
"Bump-up" request, he would give notice with reasons to MNR
and the party/person requesting the "Bump-up" that the
request has been refused. MNR, or the particular forest
company involved, would then be free to proceed with the
planning and implementation of operations.

If the Minister of the Environment agrees to the "Bump-up"
request, the Minister would give notice with reasons to MNR
and the party/person requesting the "Bump-up" that the
approval of this Class Environmental Assessment does not
apply to the specific plan, a component part of the plan, or
the major amendment. In all such cases, MNR would be
required to prepare and submit an individual environmental
assessment for the Timber Management Plan, a component part
of the plan, or the major amendment to a previously-approved
plan, for formal review and approval under The Environmental
Assessment Act. In the case of company-prepared plans or
amendments, the particular forest company involved would
provide assistance to MNR.

Opportunities for interested parties/persons to request a "Bump-up"
are also specifically incorporated in the annual planning procedure
for protection operations, as described in APPENDIX III. The
procedure for submission of a "Bump-up" request regarding
protection operations (i.e. insect and disease pest control) is
identical to the procedure outlined in the preceding paragraphs.

2.4	<u>Phasing-in Schedule</u>	1
		2
2.4.1	Timber Management Plans	3
		4
	<i>Preparation of new Timber Management Plans for all forest</i>	5
	<i>management units in the province is not achieved entirely within a</i>	6
	<i>single year, but rather occurs on a five-year cycle. In addition,</i>	7
	<i>as previously described in PART TWO, Section 2.1.1, a new Timber</i>	8
	<i>Management Plan for each management unit is produced every five</i>	9
	<i>years. Therefore, the initial application of the timber management</i>	10
	<i>planning process described in PART TWO, Section 2.1 will be</i>	11
	<i>phased-in to all management units in the province over a period of</i>	12
	<i>five years, coincident with the expiry date of the previous or</i>	13
	<i>current "Operating Plan" for each management unit.</i>	14
		15
	<i>Upon submission of the original version of this Class Environmental</i>	16
	<i>Assessment to the Ministry of the Environment in December, 1985,</i>	17
	<i>the planning process described in that document was initially</i>	18
	<i>applied to those management units for which a new Timber Management</i>	19
	<i>Plan was required by April 1, 1987. Subsequent alterations to the</i>	20
	<i>planning process, including procedures for amendments to Timber</i>	21
	<i>Management Plans, as described in this amended version of the Class</i>	22
	<i>Environmental Assessment, will apply to all future Timber</i>	23
	<i>Management Plans. Complete phase-in of the initial application of</i>	24
	<i>the planning process to all management units in the province will</i>	25
	<i>be realized by April 1, 1991.</i>	26
		27
	<i>APPENDIX IV provides a complete listing of all management units in</i>	28
	<i>Ontario, categorized by the year in which a new Timber Management</i>	29
	<i>Plan must be in place, and further differentiated by the type of</i>	30
	<i>management unit (i.e. Crown or Company Management Unit, or Forest</i>	31
	<i>Management Agreement Forest (FMA)).</i>	32
		33
2.4.2	Contingency Plans	34
		35
	<i>Unpredictable and uncontrollable circumstances may arise from time</i>	36

to time which cause the schedule for production, review and approval of a Timber Management Plan to be unattainable by the required due date. For example, such situations could occur because of staff being re-directed to deal with forest fire emergencies, because a new Forest Management Agreement (FMA) is being negotiated, or as a result of a successful "Bump-up" request. In such situations, some operations must be permitted to proceed, in order to maintain employment and prevent or minimize adverse social and economic impacts.

Also, a major natural disturbance (e.g. a forest fire) or change in circumstances could render an existing approved Timber Management Plan obsolete, requiring an unscheduled renewal of the Timber Management Plan. If the availability of approved operations in the original Timber Management Plan is insufficient, some operations must be permitted to proceed as well, in order to maintain employment and prevent or minimize adverse social and economic impacts.

Upon identification of such situations, the Director, Timber Sales Branch, will notify the Director, Environmental Assessment Branch, Ministry of the Environment, and submit a proposal for the production of a "contingency plan". That proposal will address such matters as:

- the content of the plan;
- the term of the plan;
- the schedule for its preparation, review and approval; and
- the provisions for public consultation.

Upon Environmental Assessment Branch review and endorsement of the proposal for the production of a contingency plan, MNR, or for company-prepared contingency plans the particular forest company involved, will proceed with its production.

The planning requirements will depend on the nature of the

operations proposed in the contingency plan, but will involve the same technical planning requirements as would be required if the operations were proposed in the preparation of a new Timber Management Plan. In particular, the comprehensive planning requirements for access roads and operations in areas of concern, as described in APPENDICES I and II, will apply, where applicable. The appropriate supplementary documentation is also required.

The contingency plan will be submitted for formal review and approval, and MNR will undertake an immediate review by the District and Region. If the review is favourable, the contingency plan will be approved by the Regional Director, who will notify the District Manager, and for company-prepared contingency plans, the particular forest company involved, of the MNR approval. The Regional Director will also submit a copy of the MNR-approved contingency plan to the Environmental Assessment Branch, Ministry of the Environment for their public record files.

2.4.3 Protection Operations

Application of the annual planning procedure for protection operations, as described in APPENDIX III, commenced during 1986, for the insect/disease pest control program for the spring/summer of 1987. Application of the complete planning requirements for protection operations (i.e. the requirements of STEP FOUR(III) of the timber management planning process and APPENDIX III) will not be achieved until the full phase-in of the timber management planning process to all management units.

PART THREE

IMPLEMENTATION MANUALS AND MONITORING

PART THREE: IMPLEMENTATION MANUALS AND MONITORING

1. IMPLEMENTATION MANUALS

1.1. General

A number of manuals are available to assist MNR and forest company planning staff in the timber management planning process, and to guide the implementation of timber management operations. These implementation manuals provide technical direction or working guidelines to professional foresters and staff of other MNR program groups involved in timber management. The manuals have been written primarily by MNR staff, but in some cases other government ministries/agencies or interest groups may have taken a lead role in this task. Some of the manuals have had an extensive external review prior to their finalization; others of a very technical nature may have received a limited external review. In all cases, the manuals are periodically revised to reflect new technical knowledge and the results of working experience.

This chapter discusses MNR's implementation manuals. The manuals have been grouped into three categories for explanation purposes:

- (i) Silvicultural Guides,
- (ii) Manuals for the Consideration of Other Resource Values in Timber Management, and
- (iii) Construction and Operational Manuals.

1.2 Silvicultural Guides

For the most common working groups in Ontario, MNR has produced a set of provincial Silvicultural Guides which provide general technical assistance to the management unit forester. Reference to these guides in the development of management prescriptions during the timber management planning process is mandatory.

Each Silvicultural Guide provides a description of the silvical characteristics of the working group species, and outlines methods of acceptable silvicultural practice which are commonly implemented across the province. Each guide reflects the history of experience, knowledge and available research results in the management of the working group in Ontario. At the individual management unit level, the guides are interpreted and adapted to local conditions, and in combination with the professional judgement exercised by the management unit forester, result in the formulation of a set of Silvicultural Ground Rules which is specific to the particular management unit (Refer to PART TWO, Section 2.1.2).

The following Silvicultural Guides have been produced:

- "A Silvicultural Guide to the White Pine Working Group"¹⁰;
- "A Silvicultural Guide to the Black Spruce Working Group"¹¹;
- "A Silvicultural Guide to the Hard Maple, Yellow Birch and Hemlock Working Group in Ontario"¹²;
- "A Silvicultural Guide to the Aspen Working Group in Ontario"¹³; and
- "A Silvicultural Guide to the Jack Pine Working Group in Ontario"¹⁴.

MNR is committed to the periodic review and revision of all Silvicultural Guides to ensure that these documents reflect updated scientific knowledge.

1.3 Manuals for the Consideration of Other Resource Values in Timber Management

As discussed in PART TWO, Section 1.4, in recent years MNR has placed increased emphasis on a policy of Integrated Resource Management (IRM). Implementation of this policy in timber management resulted in the preparation of MNR's "Policy for the

Integration of Other Resource Values in Timber Management"8. MNR staff use a variety of methods and wide range of available written material to implement this policy. Consideration of other resource values is formally incorporated in the timber management planning process through the requirement for inter-disciplinary planning teams and provision of opportunities for the involvement of interested external participants.

The types of information and direction available for the consideration of other resource values in timber management is discussed under the general categories of "Provincial Guidelines" and "Other Sources of Direction".

1.3.1 Provincial Guidelines

Direction for the consideration of specific resource values which could be affected by timber management operations is provided in a set of "provincial guidelines". The guidelines can be applied in the timber management planning process and during the implementation of timber management operations. The guidelines identify a range of possible techniques or methods (including the designation of reserves in which no timber management operations will be permitted) by which the impacts of timber management operations may be prevented, minimized or mitigated. Direction in the guidelines may also serve to improve the conditions for specific resource values (e.g. provision of moose habitat).

The following factors are normally considered when MNR determines whether provincial guidelines should be developed:

- the social and economic importance of the resource feature or value;
- the significance of potential effects of timber management activities;
- whether the resource feature or value is commonly found across a broad area of the province; and

- whether the particular resource feature or value lends itself to the development of provincial guidelines, or whether local variations warrant the application of a more site-specific approach.

To date, three provincial guidelines have been produced for the consideration of other resource values in timber management:

- "Timber Management Guidelines for the Protection of Tourism Values"¹⁵;
- "Guidelines for the Protection of Fish Habitat in Timber Management"¹⁶; and
- "Guidelines for Providing Moose Habitat in Timber Management"¹⁷.

These three provincial guidelines have been developed with the objective of protecting specific resource features and values (i.e. areas of tourism value, fisheries habitat and moose habitat). In the application of these guidelines, additional benefits can accrue beyond protection of those specific features and values. For example, management actions which ensure protection of fish habitat will also protect the water quality of the lakes and rivers which are the fish habitat. Management actions which protect the diverse habitat needs of a wide-ranging ungulate, such as moose, will also protect the habitat conditions which are required by a wide variety of other fauna.

Application of these three provincial guidelines in the timber management planning process is mandatory. The guidelines carry with them a requirement that minimum levels of inventory information be available before they can be effectively used in the planning process.

MNR is committed to assess the effectiveness of the direction contained in these guidelines on a periodic basis, and to revise the guidelines based on updated technical and scientific knowledge

(Refer to PART THREE, Chapter 2).

MNR also recognizes that it must continually assess the need for additional provincial guidelines. MNR is open to suggestions from concerned parties, and is prepared to work with them to develop new guidelines. The process for the development of any additional provincial guidelines will include opportunities for the participation of interested external participants, and ultimate approval by MNR's senior management.

1.3.2 Other Sources of Direction

Scientific literature and other reports are also available for use in the timber management planning process to ensure protection of particular resource features or values which could be affected by timber management operations. In some cases, MNR develops and maintains information documents for particular resource values (e.g. eagles and osprey) which amalgamate current scientific and technical knowledge.

Other government ministries/agencies, interest groups, and interested individuals may also provide information and expertise to assist in the consideration of other resource values in timber management, by providing MNR with written documents or reports, including the results of scientific studies or reviews, and by direct involvement with the MNR planning team.

1.4 Construction and Operational Manuals

MNR has developed other manuals which provide technical direction for road construction activities and specific timber management operations. Two manuals which are used in the consideration of measures to prevent, minimize or mitigate environmental effects associated with road construction activities are:

- "Resource Access Roads Policy and Implementation Strategies

and Guidelines"⁹; and

- "Construction and Mitigation Handbook for MNR Class EA Projects"¹⁸.

The first manual amalgamates current MNR policies and procedures which deal with access roads, and provides helpful direction for the planning of access roads in the timber management planning process. The second manual was developed in association with other MNR Class Environmental Assessments. Sections of this handbook address general construction activities, access roads, shoreline and streambank stabilization and gravel pits. The handbook identifies possible means to prevent, minimize or mitigate environmental effects in the implementation of such timber management operations as access road construction.

MNR recognizes a need to further amalgamate current practices, techniques and standards for access road construction into a single document which would be applied to all access road construction on Crown lands in Ontario. MNR is currently conducting a joint study with representatives of the forest products industry and the Ministry of the Environment to examine road construction techniques and measures to prevent, minimize or mitigate the environmental effects of access road construction activities. The product of this study will be a new manual, incorporating parts of existing MNR manuals with other standards for road construction used in Ontario and elsewhere. Application of this manual will be mandatory in the planning and construction of all access roads on Crown lands in Ontario.

The Ministry maintains other technical and operational manuals, which are used to guide staff in carrying out specific timber management operations. Two such manuals are:

- "Aerial Spraying for Forest Management - An Operational Manual"¹⁹; and
- "Prescribed Burning Manual"²⁰.

Use of these two manuals is currently mandatory for all MNR aerial spraying activities and prescribed burning on Crown lands in the province. The contents of these manuals are also periodically reviewed to ensure that they reflect updated knowledge, and that they maintain effective sets of instructions.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36

2. MONITORING

2.1 General

MNR is responsible for providing scientifically-based management of most of the natural resources in Ontario. A significant and standard element of MNR's natural resource management program is the prevention, minimization and mitigation of potential adverse environmental effects.

Studies of environmental effects and measures to alleviate adverse effects are carried out within the framework of MNR's Integrated Resource Management (IRM) policy, previously discussed in PART TWO, Section 1.4. Monitoring forms an integral part of MNR's resource management programs and has two components:

- (i) **compliance monitoring**, and
- (ii) **effects/effectiveness monitoring**.

2.2 Compliance Monitoring

Compliance monitoring is defined as that set of activities which is designed to ensure that operations which are carried out during the implementation of a Timber Management Plan are in conformity with:

- (i) the plan as approved; (ii) any special conditions imposed on operations by agreement or legislation; and (iii) applicable government policy. The general purpose of compliance monitoring is to ensure that timber management operations are implemented in compliance with the approved Timber Management Plan and any additional conditions.

2.2.1 Monitoring the Timber Resource

Annual Reports - "The Timber Management Planning Manual for Crown Lands in Ontario"¹ requires annual reporting, at the individual management unit level, of a number of operational activities such

as depletion of the forest, wood utilization, renewal and maintenance activities, and access road development. This annual reporting requirement provides the basis for ensuring that actual road locations and harvest, renewal and maintenance activities, as implemented, conform to the approved Timber Management Plan.

Annual reports of depletion of the forest, renewal and maintenance activities, and access road development are supplemented by aerial photography and/or maps; annual reports of wood utilization are supplemented by wood measurement data. The annual reports are submitted to the District Manager, and copies of all annual reports are provided to the MNR Regional Office and to the Director, Timber Sales Branch.

A five-year summary of those annual reports must be included in the next Timber Management Plan in a "Report of Past Forest Operations". The Report of Past Forest Operations contributes to a regular assessment of achievements, and provides background information for subsequent Timber Management Plans.

Contract/Agreement Administration - Timber management operations such as access road construction, site preparation, regeneration (i.e. planting or seeding) and aerial spraying of pesticides are carried out by MNR or by individual companies of the forest products industry. If the operations are carried out under contract with MNR, monitoring for compliance with conditions and standards is undertaken during the actual implementation of operations by direct MNR staff contract administration. Operations which are carried out by individual forest companies under Forest Management Agreements (FMAs), or under various other funding arrangements, are audited to ensure that conditions and standards have been achieved.

Cut Inspections - MNR District staff carry out "cut inspections" while harvest operations are on-going, primarily for the purposes of monitoring compliance with the approved area of harvest operations in the Timber Management Plan and conformity with timber

utilization standards set out in The Crown Timber Act and
 accompanying regulations. Cut inspection reports are filed in the
 District office.

Cut inspections will also be used to monitor compliance with
 specific modified management prescriptions in "areas of concern"
 (Refer to PART THREE, Section 2.2.2).

FMA Reviews - For Forest Management Agreement Forests (FMAs),
 regular five-year reviews of achievements and obligations must be
 undertaken before the agreements can be extended for another five
 years. Reviews are conducted by a team of reviewers under the
 direction of senior MNR staff, and are formally tabled in the
 Legislature.

Operational Audits - MNR conducts operational audits of the Forest
 Resources Program of its administrative Regions and Districts. A
 fundamental purpose of those audits is to ensure that actual
 operations comply with those planned in Timber Management Plans.
 At the Regional level, this audit also compares actual regeneration
 activities with the requirements of the Implementation Schedule of
 the Forest Production Policy, and enables tracking of achievements
 towards the provincial production target of the Forest Production
 Policy.

Other Audits - Special audits take place from time to time, and two
 such audits have taken place recently. The Provincial Auditor
 undertook an audit of MNR's Forest Resources Program in 1984-1985.
 The results of this audit were tabled in the Legislature on
 November 1, 1985. In addition, a special study was conducted in
 1986 by Dr. Gordon Baskerville, Dean of Forestry, University of New
 Brunswick. Dr. Baskerville's report, and the resulting MNR Action
 Plan, were also presented to the Legislature. The MNR action plan
 is presented in APPENDIX VII.

2.2.2 Monitoring Protection of Other Resource Values

Operations in Areas of Concern - The implementation of modified timber management operations and access road construction in "areas of concern" will be inspected for compliance. This requirement will apply to each specific area of concern for which specific access provisions or modified management prescriptions have been prescribed to protect other resource values. Records of these inspections will be maintained at the District office for regular MNR operational audit purposes.

These inspections may occur as part of the normal District cut inspection program (Refer to PART THREE, Section 2.2.1), or as a result of additional and specific directions to MNR staff to monitor compliance when dealing with a particularly sensitive environmental issue. The nature of the compliance monitoring program, including the timing and frequency of inspections, is determined as part of the planning process for areas of concern in the timber management planning process (Refer to PART TWO, Section 2.1.1). The specific nature of the compliance monitoring program will vary, depending on a variety of factors, such as:

- the sensitivity and importance of the resource feature or value which requires protection;
- the possibility of irreversible adverse environmental effects;
- the cost of mitigation or remedial measures;
- the use of a new or untested mitigation technique; and
- the history of past compliance achievements.

The development of a compliance monitoring program is an integral part of the comprehensive planning process for areas of concern. This approach provides a comprehensive, yet flexible, planning mechanism to ensure protection of other resource values in timber management. The approach will result in the development of specific compliance monitoring programs for individual forest management

units which recognize the specific characteristics of the resource features or values affected.

Administration of Other Applicable Legislation - District Managers may use administrative and legislative mechanisms in addition to The Crown Timber Act to ensure compliance with practices which provide for protection of the environment. Some timber management operations are governed by legislation which may impose standards or require specific permits or licences. Some of this legislation is administered by MNR (e.g. Forest Fires Prevention Act, Public Lands Act, and Lakes and Rivers Improvement Act), while other legislation may be the mandate of other government ministries/agencies (e.g. Ministry of the Environment, Department of Transport, etc.). Administration of MNR's legislation provides MNR with another mechanism to achieve compliance with environmentally-based standards and conditions.

2.3 Effects/Effectiveness Monitoring

Effects monitoring is intended to assess the short and long-term, direct and indirect effects of timber management operations. Effectiveness monitoring is intended to assess the effectiveness of timber management prescriptions and practices in terms of achieving the purpose of the undertaking, and the prevention, minimization and mitigation of adverse environmental effects.

2.3.1 Monitoring the Timber Resource

Traditionally, the effects/effectiveness monitoring component of MNR's timber management program has concentrated on the timber resource itself, and MNR is committed to continuing and improving this component of effects/effectiveness monitoring.

Regeneration Surveys - The "Timber Management Planning Manual for Crown Lands in Ontario"¹ requires annual reporting of various regeneration surveys, such as stocking assessments and "Free-to-

Grow" surveys. These annual reports enable MNR to assess the effectiveness of the silvicultural practices prescribed in Timber Management Plans.

As part of MNR's effectiveness monitoring program, a comprehensive system for recording survey results at the local level is being developed. Aggregation of these results will provide regional and provincial summaries.

Research - Over the past twenty years, MNR itself, and in conjunction with the Canadian Forestry Service, has undertaken a number of studies aimed at monitoring regeneration success, studies in site/productivity relationships, and mensuration studies of growth and yield. Other on-going studies deal with the assessment of specific silvicultural practices, such as site preparation techniques and various harvest methods. Since proper scientific assessment of the effectiveness of specific silvicultural practices requires both controlled and comparative study, these studies are of a continuing nature, and are ultimately intended to provide more and better guidance to professional foresters for use in the determination of appropriate silvicultural prescriptions in the timber management planning process. In addition, these studies will be used in the periodic review and revision of MNR's Silvicultural Guides, to ensure that those documents reflect updated scientific knowledge of the effectiveness of silvicultural practices.

2.3.2 Monitoring the Protection of Other Resource Values

Inspections and Evaluation - As described in PART TWO, Section 2.1.2, MNR District staff make a significant contribution in the timber management planning process to ensure that environmental considerations are incorporated in the planning of timber management operations. During and after the implementation of operations, those staff exercise their professional judgement in assessing the effects of those operations on the environment, and

their effectiveness in preventing, minimizing or mitigating adverse environmental effects.

Those MNR District staff perform inspections and evaluations to assess the readily observable effects of timber management operations in areas of concern, and the effectiveness of management prescriptions and practices which were designed to protect the specific resource features, land uses or values which occur in those areas. The nature of those inspections will vary according to the resource value which requires protection. However, inspections will occur in a manner which allows remedial action to be taken if unanticipated adverse environmental effects are observed.

Research - In addition to the direct and immediate effects of timber management operations which can be readily observed through inspections, significant environmental effects can occur which are not immediately and readily recognizable. Assessment of these effects generally requires a long-term commitment and scientific evaluation.

In an effort to achieve a better understanding of the interrelationships between timber management activities and the effects on other resource values, studies are being conducted at the national and international level. MNR participates in these studies and reviews the results of studies performed by other government agencies. The results of these studies are incorporated in the production and revision of various management guidelines and operational and technical manuals which are used by MNR and forest company staff in the planning and implementation of timber management operations.

Effects Monitoring for Resource Protection Guidelines in Ontario-

As previously discussed in PART THREE, Section 1.3.1, three provincial guidelines are applied in the timber management planning process to provide for protection of specific resource features and

values (i.e. areas of tourism value, fisheries habitat and moose habitat). The long-term effects of timber management activities on those specific resource features and values, and the effectiveness of the application of those provincial guidelines, will be assessed in a provincially-directed and coordinated monitoring program. Although many efforts have been made to understand the cause-and-effect relationships between specific timber management activities and other resources values, MNR recognizes that many uncertainties exist which limit the ability to quantify specific effects. In order to understand such interactions, rigorous scientific examination is required. Therefore, MNR has enlisted the services of Ecological and Social Systems Analysts Ltd.(ESSA), a consultant firm which has extensive experience in the field of development of environmental monitoring programs for complex bio-socio-economic environments, to assist in the establishment of MNR's monitoring priorities and the design of a monitoring program. The approach which is used by ESSA is based on the work of Dr. C.S. Holling and Dr. C.T. Walters and their colleagues, and is summarized in their book entitled "Adaptive Environmental Assessment and Management" (1978)21.

The project has two phases. The first phase involved the detailed examination of the interactions between timber management activities and moose, tourism and fisheries values. The scientific community and representatives of various Crown land resource user groups were involved in this phase of the project. Development of a computer model assisted in the analysis of the effects of timber management activities on those other resource values, and the identification of key areas of uncertainty in the activity/effects relationships. The types of studies which would be required to remove or reduce the identified areas of uncertainty were then identified.

The second phase of the project will involve the implementation and delivery of the monitoring program developed in the first phase. At the time of submission of this amended Class Environmental

Assessment, the details of that program have not yet been determined. However, general principles which will apply in that monitoring program have been established.

The program will be coordinated and directed at the provincial level. The program will meet high scientific standards, and use sampling methodologies and controlled experiments in representative geographical areas of the province, with subsequent extrapolation to similar situations throughout Ontario. The program will recognize the importance of understanding the long-term effects of timber management activities on the environment, and the need to compile adequate baseline or historic data to assess normal environmental trends and variability.

Upon the production of relevant and conclusive results of these studies, any required revisions to the three provincial guidelines will be made. MNR also undertakes to report on the results of phase two of the monitoring project at the time of the sixth-year review of this Class Environmental Assessment (Refer to PART ONE, Section 5.2).

REFERENCES

1. MNR, 1985. "Timber Management Planning Manual for Crown Lands in Ontario".
2. Armson, K.A., 1976. "Forest Management in Ontario".
3. Rowe, J.S., 1972. "Forest Regions of Canada".
4. Davis, K.P., 1966. "Forest Management: Regulation and Valuation".
5. MNR, 1978. "Forest Inventory Procedure for Ontario".
6. MNR, 1982. "Northwestern Ontario Strategic Land Use Plan".
7. MNR, 1983. "Dryden District Land Use Guidelines".
8. MNR, 1985. "Policy for the Integration of Other Resource Values in Timber Management". (Policy Number PPS 2.01.02)
9. MNR, 1985. "Resource Access Roads Policy and Implementation Strategies and Guidelines".
10. MNR, 1983. "A Silvicultural Guide to the White Pine Working Group".
11. MNR, 1974. "A Silvicultural Guide to the Black Spruce Working Group".
12. MNR, 1974. "A Silvicultural Guide to the Hard Maple, Yellow Birch and Hemlock Working Group in Ontario".
13. MNR, 1980. "A Silvicultural Guide to the Aspen Working Group in Ontario".

14. MNR, 1986. "A Silvicultural Guide to the Jack Pine Working Group in Ontario".
15. MNR, 1986. "Timber Management Guidelines for the Protection of Tourism Values".
16. MNR, 1986. "Guidelines for the Protection of Fish Habitat in Timber Management". (Draft)
17. MNR, 1986. "Guidelines for Providing Moose Habitat in Timber Management". (Draft)
18. MNR, 1982. "Construction and Mitigation Handbook for MNR Class EA Projects".
19. MNR, 1981. "Aerial Spraying for Forest Management - An Operational Manual".
20. MNR, 1984. "Prescribed Burning Manual".
21. Holling, C.S., 1978. "Adaptive Environmental Assessment and Management".

APPENDIX I

APPENDIX I

1

2

PLANNING PROCEDURE FOR MODIFIED OPERATIONS IN AREAS OF CONCERN

3

4

As described in PART TWO, Chapter 2, Section 2.1, in the planning of operations within specific areas of concern to other MNR program groups, other Crown land resource users, and interested external participants, if it is determined that modifications to normal operations are required to protect the other identified resource features, land uses or values, a detailed planning procedure must be followed. That planning procedure may be applied to an individual area of concern, or to a type of associated areas of concern, such as shorelands of lake trout lakes and deer yards.

5

6

7

8

9

10

11

12

13

14

The planning procedure requires consideration of alternatives for harvest, renewal and/or tending operations. A comprehensive evaluation and comparison of the potential environmental effects of the alternative modified management prescriptions is required, with the results of that analysis providing the basis, and supporting rationale, for the selection of the preferred/most acceptable modified management prescription.

15

16

17

18

19

20

21

22

The following discussion provides a detailed description of the comprehensive planning procedure, which involves three steps:

23

24

25

- (i) the consideration/identification of alternatives;
- (ii) the environmental analysis of the alternatives; and
- (iii) the selection of the preferred/most acceptable alternative, with supporting rationale.

26

27

28

29

30

STEP ONE: Consideration/Identification of Alternatives

31

32

For each specific area of concern, or type of associated areas of concern, alternatives for harvest, renewal and/or tending operations, as required, must be considered. In this planning procedure, those activities will normally be treated as a package,

33

34

35

36

with alternative combinations of the required operations serving as
the alternative modified management prescriptions which are
considered in the subsequent steps of the procedure.

In some cases, only one modified management prescription may be
considered to be suitable. In such situations, an environmental
analysis of the proposed modified management prescription must
still be produced, in accordance with the requirements of STEP TWO
of this planning procedure. The supporting rationale for the
selected modified management prescription, as required in STEP
THREE of this planning procedure, will provide justification for
the decision that no other suitable alternative modified management
prescriptions could be identified.

Normally, however, alternative modified management prescriptions
will be identified for each specific area of concern, or type of
associated areas of concern. The number of alternatives which are
identified for individual areas of concern may vary considerably,
depending on the physical and biological conditions encountered,
and the identified resource features, land uses or values which
require protection.

As discussed in PART THREE, Chapter 1, MNR has produced a number of
guidelines for timber management operations in various types of
areas of concern. These guidelines provide information on
alternative modified management prescriptions which could be
employed to protect particular resource features, land uses or
values. Application of three provincial guidelines, which address
the protection of fisheries habitat, moose habitat and areas of
tourism value, is mandatory in the timber management planning
process. In addition, MNR's Silvicultural Guides (Refer to PART
THREE, Chapter 1) serve as additional sources of information for
the determination of alternative modified management prescriptions.

STEP TWO: Environmental Analysis of the Alternatives

The potential environmental implications of each alternative modified management prescription must be determined in order that a selection of the preferred/most acceptable alternative may be made. For each alternative, this environmental analysis involves:

- (i) identification of the potential environmental effects;
- (ii) determination of the significance of those effects; and
- (iii) identification of potential preventive and mitigative measures.

(i) Identification of the potential environmental effects

A description of the types and variety of potential environmental effects which may be incurred by the alternative methods of carrying out harvest, renewal and tending operations is presented in PART ONE, Chapter 11, Section 11.3. The identification of the potential environmental effects of the alternative modified management prescriptions in an individual area of concern, or type of associated areas of concern, will concentrate on those potential effects which are particular to the physical and biological conditions encountered, and the potential effects on the identified resource *features, land uses or values* which require protection.

Members of the MNR multi-disciplinary planning team will contribute to the identification of the potential environmental effects of each alternative modified management prescription. Comments and submissions from interested external participants during public consultation in the preparation of the Timber Management Plan (Refer to PART TWO, Chapter 2, Section 2.1.3) will serve as additional sources of information on potential effects.

(ii) Determination of the significance of those effects

The estimation of the significance of the predicted effects (i.e. the translation of effects into impacts by incorporating value judgments) of each alternative modified management prescription is based on information which may be both qualitative (e.g. the perceived value and sensitivity of the *resource* features, *land uses or values* affected) and quantitative (e.g. the number and areal extent of the *resource* features, *land uses or values* affected).

The significant impacts of each alternative modified management prescription are identified on the basis of the professional knowledge and experience of members of the MNR multi-disciplinary planning team, and consideration of comments and submissions from interested external participants regarding the significance of the predicted effects of each alternative.

(iii) Identification of potential preventive and mitigative measures

The alternative modified management prescriptions which are identified for individual areas of concern, or types of associated areas of concern, in STEP ONE of this planning procedure inherently address modified practices which could be used to prevent, minimize or mitigate the potential adverse environmental effects of timber management operations on particular resource *features, land uses or values*. However, in certain specific areas of concern in which several resource *features, land uses or values* which require protection have been identified, it may not be possible to identify alternative modified management prescriptions which protect all of those resource *features, land uses or values* adequately. In such situations, additional measures which could be used to prevent, minimize

or mitigate the potential adverse environmental effects of
timber management operations, and for which firm commitments
can be made, must be identified for each alternative
modified management prescription. Such measures could be the
key determining factors in the ultimate selection of the
preferred/most acceptable alternative.

The net impacts of each alternative modified management
prescription are determined by qualifying the initial
identification of significant impacts (i.e. the product of (i) and
(ii)) with the benefits of the potential preventive and mitigative
measures for which firm commitments can be made (i.e. the product
(iii)). The result is an evaluation of the potential environmental
implications of each alternative, in the form of an inventory or
listing of net impacts.

**STEP THREE: Selection of the Preferred/Most Acceptable
Alternative, with Supporting Rationale**

A comparative summary of the potential environmental implications
of the alternative modified management prescriptions is produced
from the individual evaluations of each alternative, and provides
the basis for the selection of the preferred/most acceptable
alternative. The selection of the preferred/most acceptable
modified management prescription is invariably based upon
judgement. Although it may be fairly simple to select an
alternative with respect to any single potential impact, ultimately
all potential impacts must be assessed jointly. Comments and
submissions from interested external participants regarding each of
the alternatives will be particularly helpful with such decisions.

The selection of the preferred/most acceptable modified management
prescription for each specific area of concern, or type of
associated areas of concern, is recorded in the supplementary
documentation which must accompany the Timber Management Plan. That

supplementary documentation will describe how the planning
procedure was applied, and the supporting rationale for the
selection. That supporting rationale will explain the trade-offs
which were required, and the consideration of comments and
submissions from interested external participants in those
trade-offs. Where applicable, the preventive and mitigative
measures for which firm commitments can be made will also be
described.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36

Appendix II

APPENDIX II

1

2

PLANNING PROCEDURE FOR ACCESS ROADS IN AREAS OF CONCERN

3

4

As described in PART TWO, Chapter 2, Section 2.1, in the planning of operations within specific areas of concern to other MNR program groups, other Crown land resource users, and interested external participants, if a primary or secondary access road must traverse a specific area of concern, a detailed planning procedure must be followed.

5

6

7

8

9

10

11

The planning procedure requires consideration of alternative precise road locations (i.e. maximum 100 m width) for each required road within each specific area of concern. A comprehensive evaluation and comparison of the potential environmental effects of the alternative road locations is required, with the results of that analysis providing the basis, and supporting rationale, for the selection of the preferred/most acceptable road location.

12

13

14

15

16

17

18

19

The following discussion provides a detailed description of the comprehensive planning procedure, which involves three steps:

20

21

22

- (i) the consideration/identification of alternatives;
- (ii) the environmental analysis of the alternatives; and
- (iii) the selection of the preferred/most acceptable alternative, with supporting rationale.

23

24

25

26

27

STEP ONE: Consideration/Identification of Alternatives

28

29

For each required primary and secondary road within each specific area of concern, alternative precise road locations (i.e. maximum 100 m width) must be considered. In some cases, only one road location may be considered to be suitable. In such situations, an environmental analysis of the proposed road location must still be produced, in accordance with the requirements of STEP TWO of this planning procedure. The supporting rationale for the selected road

30

31

32

33

34

35

36

location, as required in STEP THREE of this planning procedure, will provide justification for the decision that no other suitable alternative road locations could be identified.

Normally, however, alternative precise road locations will be identified for each required primary and secondary access road within each specific area of concern. The number of alternatives which are identified in individual areas of concern may vary considerably, depending on the extent and configuration of the existing access system, the physical and biological conditions encountered, and the identified resource features, land uses or values which require protection.

The alternative precise road locations will be identified to a maximum width of 100 m, although some aspects of their location (e.g. stream crossings) may be more specifically defined. Segments of those precise road locations may also be common to some, or all, of the alternatives.

STEP TWO: Environmental Analysis of the Alternatives

The potential environmental implications of each alternative precise road location must be determined in order that a selection of the preferred/most acceptable alternative may be made. For each alternative, this environmental analysis involves:

- (i) identification of the potential environmental effects;
- (ii) determination of the significance of those effects; and
- (iii) identification of potential preventive and mitigative measures.

(i) Identification of the potential environmental effects

A description of the types and variety of potential environmental effects which may be incurred by access roads

is presented in PART ONE, Chapter 11, Section 11.2.2. The identification of the potential environmental effects of the alternative road locations in a specific area of concern will concentrate on those potential effects which are particular to the physical and biological conditions encountered, and the potential effects on the identified resource *features, land uses or values* which require protection.

Members of the MNR multi-disciplinary planning team will contribute to the identification of the potential environmental effects of each alternative road location. Comments and submissions from interested external participants during public consultation in the preparation of the Timber Management Plan (Refer to PART TWO, Chapter 2, Section 2.1.3) will serve as additional sources of information on potential effects.

(ii) Determination of the significance of those effects

The estimation of the significance of the predicted effects (i.e. the translation of effects into impacts by incorporating value judgments) of each alternative road location is based on information which may be both qualitative (e.g. the perceived value and sensitivity of the features or resource *features, land uses or values* affected) and quantitative (e.g. the number and areal extent of the *resource features, land uses or values* affected).

The significant impacts of each alternative road location are identified on the basis of the professional knowledge and experience of members of the MNR multi-disciplinary planning team, and consideration of comments and submissions from interested external participants regarding the significance of the predicted effects of each alternative.

(iii) Identification of potential preventive and mitigative measures

There may be measures, over and above the normal operations employed in the construction of access roads, which could be used to prevent, minimize or mitigate the potential adverse environmental effects of each alternative road location.

MNR's "Construction and Mitigation Handbook for MNR Class EA Projects"¹⁸ (Refer to PART THREE, Chapter 1) serves as the principal source for the identification of potential preventive and mitigative measures for access road construction.

In addition, consideration of "use management strategies" for each alternative road location, as is ultimately required for each primary and secondary road proposed in a Timber Management Plan, may serve as a principal determinant of potential preventive and mitigative measures. MNR's "Resource Access Roads Policy and Implementation Strategies and Guidelines"⁹ provide a comprehensive description of potential use management strategies which could be employed.

Potential preventive and mitigative measures for which firm commitments can be made must be identified for each alternative road location. Such measures could be the key determining factors in the ultimate selection of the preferred/most acceptable alternative.

The net impacts of each alternative precise road location are determined by qualifying the initial identification of significant impacts (i.e. the product of (i) and (ii)) with the benefits of the potential preventive and mitigative measures for which firm commitments can be made (i.e. the product (iii)). The result is an evaluation of the potential environmental implications of each alternative, in the form of an inventory or listing of net impacts.

STEP THREE: Selection of the Preferred/Most Acceptable
Alternative, with Supporting Rationale

A comparative summary of the potential environmental implications of the alternative precise road locations is produced from the individual evaluations of each alternative, and provides the basis for the selection of the preferred/most acceptable alternative. The selection of the preferred/most acceptable road location is invariably based upon judgement. Although it may be fairly simple to select an alternative with respect to any single potential impact, ultimately all potential impacts must be assessed jointly. Comments and submissions from interested external participants regarding each of the alternatives will be particularly helpful with such decisions.

The selection of the preferred/most acceptable location for each required primary and secondary access road within each area of concern is recorded in the supplementary documentation which must accompany the Timber Management Plan. That supplementary documentation will describe how the planning procedure was applied, and the supporting rationale for the selection. That supporting rationale will explain the trade-offs which were required, and the consideration of comments and submissions from interested external participants in those trade-offs. Where applicable, the preventive and mitigative measures for which firm commitments can be made will also be described.

Appendix III

APPENDIX III

ANNUAL PLANNING PROCEDURE FOR PROTECTION OPERATIONS

INTRODUCTION

In timber management, maintenance operations include measures which are carried out to protect the growing or mature forest from insect and disease infestations. These protection operations are commonly referred to as the activity of insect/disease pest control.

The focus of insect/disease pest control operations in timber management is not normally suppression of the insect/disease populations, but rather protection of the growing or mature forest from the debilitating effects of insect/disease infestations. In some situations, suppression or containment of insect populations may be undertaken.

As discussed in PART TWO, Section 2.1.2, in the preparation of a Timber Management Plan it is not possible to specifically identify the areas of a management unit on which protection operations will be carried out, because of the unpredictable nature of insect and disease infestations. Rather, for the five-year term of a Timber Management Plan, the areas of a management unit on which protection operations may be carried out, if required, are identified.

The occurrence and extent of insect and disease infestations are determined annually through regular surveys conducted by the Canadian Forestry Service, an agency within the federal Department of Agriculture. Consequently, annual planning requirements are necessary to identify the specific areas within a management unit which require protection, and to determine the insect/disease pest control operations which will be carried out.

While equally applicable to protection operations for disease infestations, the predominant focus of the annual planning

procedure is large-scale insect infestations, such as spruce
budworm, oak leaf shredder, jack pine budworm, Gypsy moth and
forest tent caterpillar. Control of insect infestations normally
requires consideration of the application of insecticides,
involving various chemical and biological agents, to protect the
current year's foliage, to suppress insect infestation epicenters,
and to contain outbreaks.

The following discussion outlines the details of the annual
planning procedure for aerial protection operations, including
provisions for public consultation. The planning procedure is
applied at the MNR District level, and therefore addresses
protection operations for all management units within the District
as a single package.

DISTRICT AND REGIONAL COMMITTEES

Upon receipt of the results of the annual insect/disease surveys
conducted by the Canadian Forestry Service (normally in August of
each year), the District Manager establishes a District working
committee which is responsible for the application of this annual
planning procedure. This committee normally includes the same staff
members as the MNR multi-disciplinary planning team involved in the
preparation of the Timber Management Plans for management units in
the District. In addition, a representative from the Canadian
Forestry Service and representatives from MNR's Pest Control
Section, Forest Resources Group, Main Office and the major forest
companies operating in the District are also included.

If several Districts within a Region are involved, the Regional
Director may also establish a Regional coordinating committee,
with responsibility for overseeing the consistent application of
the procedure and co-ordination of the results across all Districts
within the Region. Similarly, in cases where an insect/disease
infestation occurs in more than one Region, or where a number of
separate insect/disease infestations occur in several Regions, the

Director, Forest Resources Branch, Forest Resources Group, Main
Office may also establish a provincial coordinating committee to
ensure consistency of approach and co-ordination of results across
the province.

Depending on the extent of the insect/disease infestations, and
therefore the expected size of the insect/disease pest control
program, the Pesticides Control Officer of the appropriate Regional
Office of the Ministry of the Environment may also be a member of
either the District working committee or the Regional coordinating
committee.

SELECTION OF AREAS FOR PROTECTION OPERATIONS

As described in PART TWO, Section 2.1.2, in the Timber Management
Plan for each management unit within the District, areas have been
identified as eligible for protection operations, if required,
during the five-year term. The annual insect/disease surveys
conducted by the Canadian Forestry Service establish the occurrence
and extent of insect/disease infestations during a particular year.
The combination of the identification of areas eligible for
protection operations and the results of the annual insect/disease
surveys enables the selection of areas which require protection to
control insect/disease infestations during the following year,
normally in late spring/early summer.

On the basis of this information, the District working committee
makes a recommendation to the Regional Director (normally in
September of each year) concerning the need for protection
operations, and requests permission to proceed with planning.

CONSIDERATION AND ANALYSIS OF OPTIONS FOR PROTECTION OPERATIONS

Upon endorsement by the Regional Director of the need for
protection operations, the District working committee proceeds with
the consideration and analysis of optional treatments for the

control of insect/disease infestations in the areas selected for protection during the next spring/summer, and the selection of a recommended course of action.

The following options would normally be considered, individually or in combination:

- (i) no treatment;
- (ii) accelerated harvest operations in the areas of the infestation;
- (iii) re-direction of harvest operations from non-infested areas to the areas of the infestation;
- (iv) salvage operations (to prevent other insect/disease infestations and to utilize the damaged timber before it degenerates); and
- (v) use of insecticides/fungicides (chemical and /or biological).

The analysis of the options, which provides the basis, and supporting rationale, for the selection of a recommended course of action, involves an evaluation and comparison of:

- (i) their relative effectiveness in protecting the forest and controlling the insect/disease infestations;
- (ii) estimated economic costs and benefits;
- (iii) *concerns of other MNR program groups and other Crown land resource users; and*
- (iv) potential environmental impacts, and measures to prevent, minimize or mitigate those impacts.

The District working committee's consideration and analysis of options, and selection of a recommended course of action, must be documented and submitted for review by the Regional Director. If the Regional Director has also established a Regional coordinating committee, that committee initially amalgamates the recommendations from all Districts in the Region. The Regional Director then

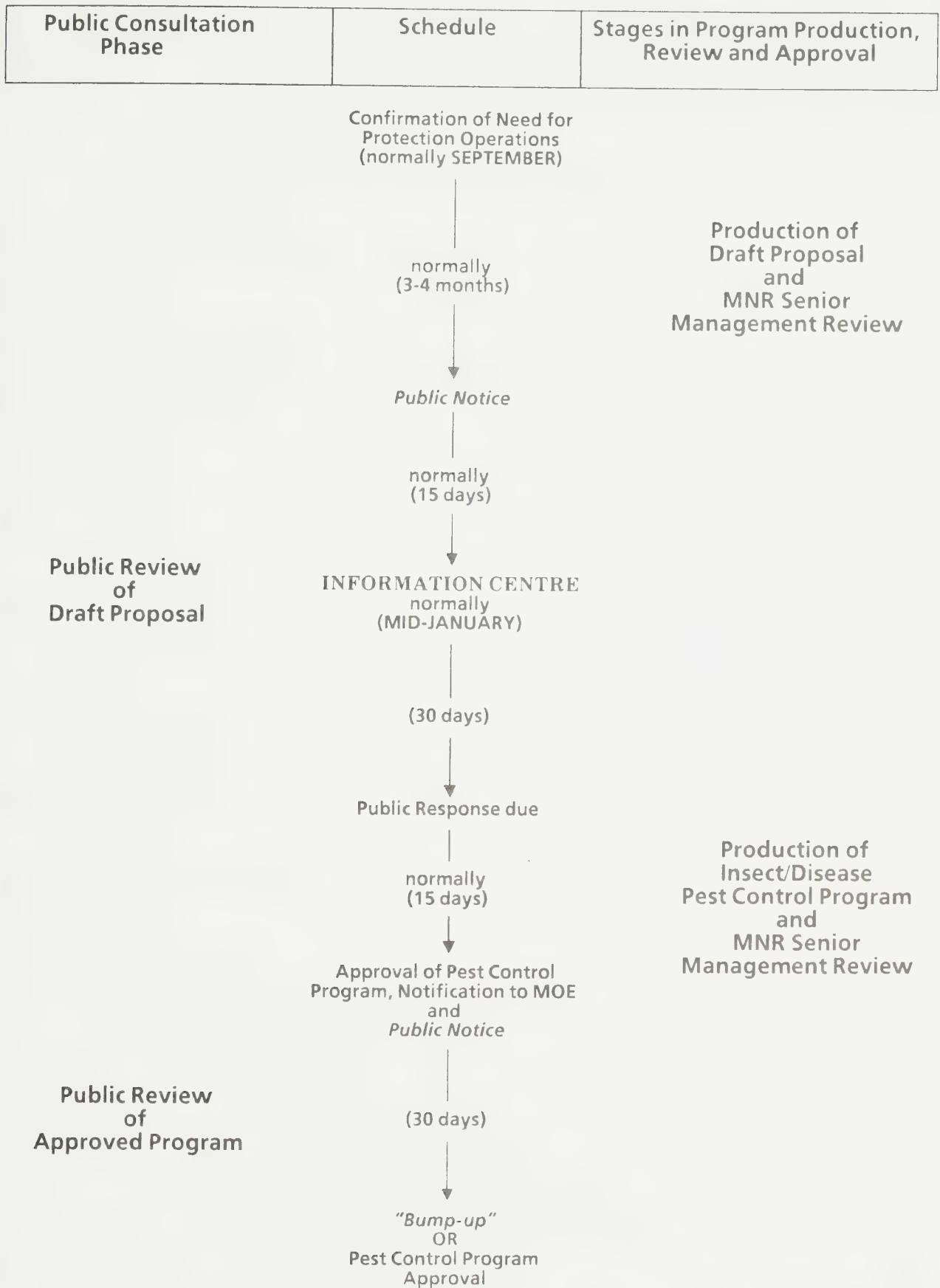
reviews those recommendations and makes a decision on a coordinated Regional recommendation for review by senior management at MNR's Main Office. Similarly, if the Director, Forest Resources Branch has also established a provincial coordinating committee, that committee initially amalgamates the recommendations from all Regions. The Director, Forest Resources Branch then reviews those recommendations and makes a decision on a coordinated provincial recommendation for review by senior management at MNR's Main Office.

If the recommended course of action involves the use of insecticides/fungicides, a draft proposal for specific insect/disease pest control projects must also be produced for review at this stage of the annual planning procedure. If the recommended course of action involves accelerated harvest operations, re-directed harvest operations or salvage operations, no further planning is required at this stage of the annual planning procedure. Rather, an amendment to the Timber Management Plan for the appropriate management units in the District is required. In either case, review and endorsement of the recommended course of action by the Regional Director and senior management at MNR's Main Office is required prior to proceeding with planning.

The planning procedure for amendments to Timber Management Plans (Refer to PART TWO, Section 2.1.5) applies if the recommended course of action involves accelerated harvest operations, redirected harvest operations or salvage operations.

The remainder of this annual planning procedure applies only if the recommended course of action involves the use of insecticides/fungicides for insect/disease pest control. FIGURE III-1 outlines the schedule for the production, review and approval of a District insect/disease pest control program which involves the use of insecticides/fungicides. That schedule is designed to ensure that an approved program is in place by the first day of April of the year in which insect/disease pest control operations must be

Figure III-1
Schedule: Insect/Disease Pest Control Program
Production, Review and Approval



carried out.

Two formal opportunities for public consultation are provided:

- (i) an opportunity to REVIEW a draft proposal at an INFORMATION CENTRE, prior to a final decision on the program; and
- (ii) an opportunity for INSPECTION of the approved program.

In addition, as previously discussed in PART TWO, Section 2.3, opportunities for interested parties/persons to request a "Bump-up" of the District insect/disease pest control program are provided. The "Bump-up" procedure may be initiated at any time during the planning of the annual insect/disease pest control program, with a final opportunity within thirty (30) days of the public notice advising interested participants that the MNR-approved program is available for inspection at the MNR District office. The procedure for submission of a "Bump-up" request is identical to the procedure outlined for a Timber Management Plan in PART TWO, Section 2.3.

A description of each of the formal opportunities for public consultation is provided in the following discussion of the schedule for the production, review and approval of a District insect/disease pest control program.

PUBLIC REVIEW - INFORMATION CENTRE

After confirmation of the need for the use of insecticides/fungicides and review of the draft proposal for specific insect/disease pest control projects by MNR's senior management, an opportunity is provided for public REVIEW of MNR's proposed insect/disease pest control program for the District. The District Manager will issue a public notice, normally fifteen (15) days in advance, inviting all interested participants to an INFORMATION CENTRE (normally in mid-January) to review, and comment on, the draft proposal. At the same time, the District Manager will notify

the Pesticides Control Officer of the appropriate Regional Office
of the Ministry of the Environment.

The public notice will normally be in the form of:

- direct written invitations to all previously identified participants in the preparation of the Timber Management Plans for individual management units in the District, and those parties/persons known to be directly affected by insect/disease pest control operations which MNR proposes to carry out in the District in the late spring/early summer; and
- general public notices, usually in the form of paid public advertisements in the local media, advising the general public of the opportunity to REVIEW the draft proposal at the INFORMATION CENTRE.

Direct verbal communication may serve as *an additional* form of notification, where appropriate.

The public notice will include a map of the District which identifies areas in which MNR proposes to use insecticides/fungicides for insect/disease pest control purposes.

The public notice will inform interested participants that the INFORMATION CENTRE provides an opportunity to review, and comment on, MNR's proposed insect/disease pest control program for the District, and the draft proposal for specific insect/disease pest control projects, before decisions are made. At the INFORMATION CENTRE, MNR staff will be present to explain the proposed insect/disease pest control program and the supporting analysis of options, and to respond to any inquiries.

Although a broad array of information will be provided at the INFORMATION CENTRE in the form of maps, displays and written material, the following information must be available, and is

expected to be the principal focus of attention:

- maps which identify areas of the District in which MNR proposes to use insecticides/fungicides for insect/disease pest control purposes;
- the analysis of optional treatments for the control of the insect/disease infestations; and
- the draft proposal for specific insect/disease pest control projects.

The minimum requirement for the *INFORMATION CENTRE* is a one-day opportunity at a convenient location. A period of thirty (30) days after the date of the *INFORMATION CENTRE* is provided for interested participants to present submissions to the District Manager regarding concerns with MNR's proposed insect/disease pest control program. After the thirty (30)-day review period, MNR will consider the submissions and make a final decision on an insect/disease pest control program for the District.

FINALIZATION AND REVIEW OF DISTRICT PROGRAM

In the finalization of the District insect/disease pest control program, the District working committee initially reviews and summarizes the submissions received during public consultation and forwards the summary to the Regional Director. If the Regional Director has also established a Regional coordinating committee, that committee initially amalgamates the summaries of public submissions from all Districts in the Region. Similarly, if the Director, Forest Resources Branch has also established a provincial coordinating committee, that committee initially amalgamates the summaries of public submissions from all Regions.

The District working committee then prepares final project descriptions for the specific insect/disease pest control projects which will be carried out in the District, taking into consideration the public submissions which have been received.

Those final project descriptions are then submitted for review by the District Manager and Regional Director, and approval by the District Manager.

The finalization and review of the District insect/disease pest control program will normally be completed within fifteen (15) days.

NOTIFICATION TO MINISTRY OF THE ENVIRONMENT

At least sixty (60) days prior to the expected date of commencement of the District insect/disease pest control program, the District Manager will formally submit an "Application to Perform an Extermination from an Airborne Machine" (MOE Form 5), as required under The Ontario Pesticides Act, to the Regional Director (Attention: Pesticides Control Officer) of the appropriate Regional Office of the Ministry of the Environment (MOE). Submission of this application initiates the formal review and approval process by the Ministry of the Environment under The Ontario Pesticides Act. A copy of the final project descriptions for the District insect/disease pest control program accompanies the application.

Submission of the application will also serve as formal notification to the Ministry of the Environment of the MNR approval of the District insect/disease pest control program and final project descriptions. The following information will also be submitted:

- documentation of MNR's recommended insect/disease pest control program for the District, and the supporting analysis of options;
- a copy of the summary of public submissions on the proposed insect/disease pest control program; and
- a copy of the final project descriptions for specific insect/disease pest control projects.

The District Manager will also notify the Director, Environmental Assessment Branch, Ministry of the Environment of the MNR-approved insect/disease pest control program for the District, by sending a copy of the covering letter which accompanied the MOE Form 5 application and supporting documentation requirements to the appropriate Regional Office of that Ministry, as well as a copy of the application itself.

PUBLIC INSPECTION OF APPROVED PROGRAM

At the same time as the Ministry of the Environment is notified, the District Manager will issue a public notice advising all interested participants that the MNR-approved project descriptions for specific insect/disease pest control projects are available for inspection at the MNR District office.

The public notice will normally be in the form of:

- direct written notices to all previously identified participants, and all parties/persons known to be directly affected by insect/disease pest control operations which MNR will carry out in the District in the late spring/early summer; and
- general public notices, usually in the form of paid public advertisements in the local media, advising the general public of the opportunity for inspection of the final MNR-approved project descriptions for specific insect/disease pest control projects in the District.

Direct verbal communication may serve as an *additional* form of notification, where appropriate.

The public notice will clearly indicate that the opportunity for inspection of the MNR-approved project descriptions provides a final opportunity for interested participants to request a "Bump-up" of the District insect/disease pest control program, or

any specific project in the program, to individual environmental
assessment status (Refer to PART TWO, Section 2.3). A thirty
(30)-day period after the date of the public notice is provided for
interested participants to pursue such a request. If a request is
not received during that period, the MNR-approved project
descriptions for specific insect/disease pest control projects
automatically receive final approval.

Upon expiry of the thirty (30)-day period for "Bump-up" requests,
the District Manager will notify the Pesticides Control Officer of
the appropriate Regional Office of the Ministry of the Environment.
The Pesticides Control Officer will then proceed with the formal
review and approval of the final project descriptions for specific
insect/disease pest control projects in the District, as required
under The Ontario Pesticides Act.

The final approved project descriptions for specific insect/disease
pest control projects will be formally appended to the Annual Work
Schedule for the appropriate management units in the District, as
part of the description of operations which will be carried out
during the next twelve-month period. As described in PART TWO,
Section 2.2.4, the Annual Work Schedule will remain available for
inspection at the MNR District office at any time during its
twelve-month term of application.

PUBLIC NOTICE PRIOR TO OPERATIONS

The public notice requirement described in the preceding section
serves as the public notification which is required as normal MNR
procedure at least thirty (30) days prior to the anticipated date
of any aerial application of insecticides/fungicides (Refer to PART
TWO, Section 2.2.4). The same public notice will be issued again
seven (7) days prior to the anticipated date of application.

This public notice will normally be in the form of paid public
advertisements in the local media, advising all interested and

potentially affected parties/persons, and the general public, that
 the projects will soon be implemented, and offering the opportunity
 for inspection of the approved project descriptions for specific
 insect/disease pest control projects at the MNR District office.

INFESTATIONS WHICH REQUIRE IMMEDIATE TREATMENT

*Insect/disease infestations can occur suddenly and may threaten
 forest stands with specific timber values which require protection.
 Upon discovery of a sudden insect/disease infestation, which is
 normally localized, if it is determined that the most appropriate
 means of treatment involves ground application of insecticides/
 fungicides, no further detailed planning will be undertaken. All
 such ground applications will involve the use of only registered
 materials, and will be undertaken by personnel licensed by the
 Ministry of the Environment under The Ontario Pesticides Act.*

*If the preferred means of treatment involves the aerial application
 of insecticides/fungicides, the MNR Regional Director will notify
 the appropriate Regional Office, and the Environmental Assessment
 Branch, of the Ministry of the Environment. All necessary approvals
 for those operations under The Ontario Pesticides Act will be
 obtained before operations commence.*

Appendix IV

1
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36

APPENDIX IV

PHASING-IN SCHEDULE: TIMBER MANAGEMENT PLANS

This appendix provides a complete listing of all forest management units for which Timber Management Plans are produced in Ontario, categorized by the year in which a new plan must be in place. The listing commences with those management units for which a new Timber Management Plan must be in place by April 1, 1987. Complete phase-in of the timber management planning process described in PART TWO, Chapter 2, Section 2.1 in the preparation of Timber Management Plans for all management units in the province will be realized by April 1, 1991.

In some instances, the preparation of the Timber Management Plan for a management unit may be deferred. Any such management units are identified in the phasing-in schedule, and the reason(s) for the deferral is (are) provided. In each case, a "contingency plan" (Refer to PART TWO, Section 2.4.2) will be produced to permit some operations to proceed while the Timber Management Plan is prepared.

(NOTE: The listing reflects the status of management units in the province as of June 1, 1987, and is subject to change.)

1987

1

2

3

COMPANY MANAGEMENT UNITS

4

5

<u>REGION</u>	<u>DISTRICT</u>	<u>MANAGEMENT UNIT</u> <u>(& COMPANY)</u>
---------------	-----------------	--

6

7

8

Northwestern	Sioux Lookout	Lac Seul* (1)
--------------	---------------	---------------

9

(MacKenzie Forest
Products)

10

11

North Central	Terrace Bay	
---------------	-------------	--

Big Pic

12

(James River-Marathon
Ltd.)

13

14

15

* Scheduled to become an FMA in 1987

16

17

FMA's

18

19

<u>REGION</u>	<u>DISTRICT</u>	<u>MANAGEMENT UNIT</u> <u>(& COMPANY)</u>
---------------	-----------------	--

20

21

22

Northwestern	Fort Frances	
--------------	--------------	--

Manitou Forest

23

(Boise-Cascade Canada
Ltd.)

24

25

Seine River Forest

26

(Boise-Cascade Canada
Ltd.)

27

28

North Central	Thunder Bay	
---------------	-------------	--

Black Sturgeon Forest

29

(Great Lakes Forest
Products Ltd.)

30

31

Northern	Chapleau	
----------	----------	--

Pineland Forest

32

(E.B. Eddy Forest

33

Products Ltd.)

34

35

36

	Superior Forest (2)	1
	(Superior Forest	2
	Management Ltd.)	3
Hearst	Hearst Forest (3)	4
	(Hearst Forest Management	5
	Inc.)	6
	Nagagami Forest	7
	(Quebec North Shore-	8
	Ontario Paper Company)	9
Timmins	R. Malette Forest	10
	(Malette Lumber Inc.)	11

NOTE

- (1) Plan preparation deferred, pending successful negotiation of a Forest Management Agreement (FMA) during 1987. Pursuant to an Agreement, approved plan must be in place within twelve (12) months.
- (2) Plan preparation deferred; Forest Management Agreement (FMA) executed in May, 1987. Pursuant to the Agreement, approved plan must be in place by May, 1988.
- (3) Plan preparation deferred; Forest Management Agreement (FMA) executed in November, 1986. Pursuant to the Agreement, approved plan must be in place by November, 1987.

1988CROWN MANAGEMENT UNITS

<u>REGION</u>	<u>DISTRICT</u>	<u>MANAGEMENT UNIT</u>
Northern	Cochrane	Cochrane
		Moose River
	Kirkland Lake	W.L. Plonski Forest
		Watabeag (1)
Eastern	Carlton Place	Lanark

COMPANY MANAGEMENT UNITS

<u>REGION</u>	<u>DISTRICT</u>	<u>MANAGEMENT UNIT</u> <u>(& COMPANY)</u>
North Central	Nipigon	Kiashke
		(Kiashke Native
		Development
		Incorporated)
Northern	Chapleau	Martel (J.E. Martel and
		Sons Lumber Ltd.)
	Kirkland Lake	Iroquois Falls South (1)
		(Abitibi-Price Inc.)

FMA's

<u>REGION</u>	<u>DISTRICT</u>	<u>MANAGEMENT UNIT</u> <u>(& COMPANY)</u>
Northern	Cochrane	Cochrane Forest
		(Quebec North Shore
		Ontario Paper Company)

1989

1

2

3

CROWN MANAGEMENT UNITS

4

5

<u>REGION</u>	<u>DISTRICT</u>	<u>MANAGEMENT UNIT</u>
---------------	-----------------	------------------------

6

7

Northern	Kapuskasing	Kapuskasing
----------	-------------	-------------

8

	Kirkland Lake	Elk Lake
--	---------------	----------

9

		Timiskaming
--	--	-------------

10

11

COMPANY MANAGEMENT UNITS

12

13

<u>REGION</u>	<u>DISTRICT</u>	<u>MANAGEMENT UNIT</u>
---------------	-----------------	------------------------

14

		<u>(& COMPANY)</u>
--	--	------------------------

15

16

Northwestern	Sioux Lookout	Reba
--------------	---------------	------

17

		(Abitibi-Price Inc.)
--	--	----------------------

18

19

FMA's

20

21

<u>REGION</u>	<u>DISTRICT</u>	<u>MANAGEMENT UNIT</u>
---------------	-----------------	------------------------

22

		<u>(& COMPANY)</u>
--	--	------------------------

23

24

Northwestern	Dryden	East Patricia Forest
--------------	--------	----------------------

25

		(Boise-Cascade Canada
--	--	-----------------------

26

		Ltd.)
--	--	-------

27

	Kenora	Lake of the Woods Forest
--	--------	--------------------------

28

		(Boise-Cascade Canada
--	--	-----------------------

29

		Ltd.)
--	--	-------

30

	Red Lake	Pakwash Forest
--	----------	----------------

31

		(Boise-Cascade Canada
--	--	-----------------------

32

		Ltd.)
--	--	-------

33

		Trout Lake Forest
--	--	-------------------

34

		(Great Lakes Forest
--	--	---------------------

35

		Products Ltd.)
--	--	----------------

36

		7
Northeastern	Wawa	
	Magpie Forest	1
	(Dubreuil Brothers Ltd.)	2
		3
		4
		5
		6
		7
		8
		9
		10
		11
		12
		13
		14
		15
		16
		17
		18
		19
		20
		21
		22
		23
		24
		25
		26
		27
		28
		29
		30
		31
		32
		33
		34
		35
		36

1990CROWN MANAGEMENT UNITS

<u>REGION</u>	<u>DISTRICT</u>	<u>MANAGEMENT UNIT</u>	
			1
			2
			3
			4
			5
			6
North Central	Atikokan	Flanders	7
		Sapawe	8
Northeastern (1)	Blind River	Blind River	9
		Kirkwood	10
		Peshu Lake	11
	Espanola	Manitoulin	12
		Spanish River	13
	North Bay	Mattawan	14
		Tomiko	15
		Verner	16
		Wasi	17
	Sault Ste. Marie	Goulais-Batchawana	18
		Ranger Lake	19
		Sault Ste. Marie	20
	Sudbury	Killarney	21
		Trout Lake	22
		Wanapitei	23
	Temagami	Latchford	24
		Temagami	25
	Wawa	Jack Pine River	26
		Lake Superior Provincial	27
		Park	28
		<i>Tikamaganda</i>	29
		Wawa	30
Algonquin	Bancroft	Bancroft	31
	Bracebridge	Bracebridge	32
	Minden	Frost Centre	33
		Minden	34
	Parry Sound	Georgian Bay	35
		Parry Sound	36

	Pembroke	Bonnechere	1
		Madawaska	2
Eastern	Tweed	Tweed	3
			4

COMPANY MANAGEMENT UNITS 5

6

<u>REGION</u>	<u>DISTRICT</u>	<u>MANAGEMENT UNIT</u>	7
		<u>(& COMPANY)</u>	8
			9
Northwestern	Sioux Lookout	Abitibi Sioux Lookout	10
		(Abitibi-Price Inc.)	11
		Caribou East	12
		(Great Lakes Forest	13
		Products Ltd.)	14
		Caribou West	15
		(Great Lakes Forest	16
		Products Ltd.)	17
North Central	Nipigon	Domtar-Armstrong	18
		(Domtar Forest Products)	19
Algonquin	Algonquin Park	Algonquin Park	20
		(Algonquin Forestry	21
		Authority)	22
			23

FMA's 24

25

<u>REGION</u>	<u>DISTRICT</u>	<u>MANAGEMENT UNIT</u>	26
		<u>(& COMPANY)</u>	27
			28
Northwestern	Ignace	English River Forest	29
		(Great Lakes Forest	30
		Products Ltd.)	31
North Central	Geraldton	Longlac Forest	32
		(Kimberly-Clark of Canada	33
		Ltd.)	34
			35
			36

		Nakina Forest	1
		(Kimberly-Clark of Canada	2
		Ltd.)	3
	Thunder Bay	Brightsands Forest	4
		(Great Lakes Forest	5
		Products Ltd.)	6
		<i>Dog River-Matawin Forest</i>	7
		(Great Lakes Forest	8
		Products Ltd.)	9
Northern	Cochrane	Iroquois Falls Forest	10
		(Abitibi-Price Inc.)	11
	Gogama	Upper Spanish Forest	12
		(E.B. Eddy Forest	13
		Products Ltd.)	14
	Kapuskasing	Gordon Cosens Forest	15
		(Spruce Falls Power and	16
		Paper co. Ltd.)	17
Northeastern	Espanola	Lower Spanish Forest	18
		(E.B. Eddy Forest	19
		Products Ltd.)	20

21

22

NOTE 23

24

(1) *Amalgamation and redefinition of management units for all* 25

Crown management units in Northeastern Region are planned in 26

1988. 27

28

29

30

31

32

33

34

35

36

	Nipigon	Auden	1
		(Abitibi-Price Inc.)	2
Northern	Cochrane	Smooth Rock Falls	3
		(Waferboard Corporation	4
		Ltd.)	5

* Scheduled to become an FMA in 1988 6

FMA's 7

<u>REGION</u>	<u>DISTRICT</u>	<u>MANAGEMENT UNIT</u>	8
		<u>(& COMPANY)</u>	9
			10
North Central	Nipigon	Lake Nipigon Forest	11
		(Domtar Forest Products)	12
	Terrace Bay	Black River Forest	13
		(Great West Timber Ltd.)	14
	Thunder Bay	Spruce River Forest	15
		(Abitibi-Price Inc.)	16

NOTE 17

(1) Plan preparation may be advanced pending negotiation of a 18
 Forest Management Agreement (FMA) during 1988. Pursuant to 19
 an Agreement, approved plan must be in place within twelve 20
 (12) months. 21

Appendix V

APPENDIX V

1

2

PRE-SUBMISSION CONSULTATION

3

4

INTRODUCTION

5

6

In the preparation of the Class Environmental Assessment for Timber Management, MNR has maintained an open approach to the development and review of the document. In September, 1983, MNR publicly released a draft Class Environmental Assessment which became the subject of an extensive process of public consultation. This process of "pre-submission consultation" was intended to act as a mechanism whereby the Ministry could invite comments from concerned and affected groups on a draft document, and make adjustments prior to formal submission of an environmental assessment to the Minister of the Environment.

7

8

9

10

11

12

13

14

15

16

17

In pre-submission consultation, the Ministry sought to involve a broad range of concerned and affected parties. Participants included representatives from the forest industry, the tourism industry, native organizations and Government ministries/agencies, as well as recreation, conservation and environmental interest groups. The list of organizations which were formally invited to participate was derived primarily from the list of participants involved in MNR's land use planning program.

18

19

20

21

22

23

24

25

26

Direct consultation with the general public was not undertaken. However, copies of the draft Class Environmental Assessment were made available for review at the Ministry's District and Regional offices. The Ministry also forwarded the document to the libraries of all Community Colleges and Universities in the Province. In addition, copies of the document were supplied to individuals and other organizations upon request.

27

28

29

30

31

32

33

34

MNR initiated pre-submission consultation to solicit and consider the concerns of various groups before preparing and submitting a

35

36

final Class Environmental Assessment. It was hoped that through pre-submission consultation the Ministry would be able to resolve concerns prior to formal submission, thereby minimizing problems during the formal Government review and approval process associated with The Environmental Assessment Act.

The pre-submission consultation process began with a pair of meetings chaired by the Deputy Minister of Natural Resources - one with representatives of the forest industry, and another with representatives of selected interest groups. These meetings were organized to present and distribute the draft Class Environmental Assessment to these groups and to solicit their participation. Lists of organizations invited to those meetings, and attendees, are presented in LIST V-1 and LIST V-2, respectively.

The Ministry also arranged and hosted a media briefing to which representatives from various newspapers and other publications were invited. This briefing publicly introduced the draft Class Environmental Assessment and explained the process of pre-submission consultation.

The pre-submission consultation process has taken place in two phases. In Phase I, submissions were solicited from the various groups involved; the Ministry then considered those submissions and prepared responses to them. In Phase II, MNR presented those responses to concerned groups, and submissions were once again solicited for further consideration. The following discussion presents a detailed description of the pre-submission consultation process in Phase I and Phase II.

Phase I (September, 1983 - January, 1985)

In Phase I, the Ministry organized a series of seminars to describe the general approach to the draft Class Environmental Assessment and the specific details of its contents. Four separate seminars were held in order to accommodate the large number of participants.

Each seminar was directed to a specific group of participants (i.e. forest industry representatives, Government ministries/agencies and interest groups). If participants were unable to attend their assigned seminar, attempts were made to accommodate them at an alternate seminar. Lists of organizations invited to those seminars, and attendees, are presented in LIST V-3 and LIST V-4, respectively.

At each seminar, the participants were provided with copies of the draft Class Environmental Assessment as well as a copy of the material used in the presentation. Participants were requested to submit comments to the Ministry regarding the draft document. The Ministry also offered to undertake additional seminars or meetings for the executives or memberships of the various organizations involved. Participants were later sent a reminder letter which formally requested submissions.

In total, forty-one submissions were received. The Ministry received twelve responses from government ministries/agencies; ten from forest industry companies or organizations; sixteen from interest groups; and four from unsolicited sources. Each submission was acknowledged and copies of all submissions were distributed to each respondent and to the Ministry of the Environment. Submissions from unsolicited respondents were individually acknowledged and distributed to others, but these respondents did not receive copies of all other submissions. A list of all respondents is presented in LIST V-5.

From late 1983 to late 1984, meetings were held with various groups to discuss their submissions and MNR's proposed approaches to dealing with issues identified in those submissions. MNR met separately with the Ontario Forest Industries Association (OFIA) in the fall of 1983 and the summer of 1984, the Northern Ontario Tourist Outfitters Association (NOTO) in the spring of 1984, and the Ministry of Tourism and Recreation (MTR) in the spring and winter of 1984. Discussions at these meetings were primarily

related to the timber management planning process and the proposed changes to accommodate individual concerns. In the fall of 1984, MNR met with the Environmental Approvals and Project Engineering Branch of the Ministry of the Environment to discuss their concerns, in particular MNR's treatment of the use of pesticides in timber management.

In July 1984, a letter which provided a status report on the pre-submission consultation process was forwarded to all participants who made submissions following the initial seminars. The letter also identified the Ministry's intent to hold further discussions with participants prior to finalization and formal submission of the Class Environmental Assessment.

Several meetings were held during the summer and fall of 1984 with the Environmental Assessment Branch of the Ministry of the Environment, at both a staff level and a senior management level. This series of meetings eventually led to the finalization of MNR's responses to the issues identified in Phase I of the pre-submission consultation process.

During the analysis of the submissions, all submissions were summarized and nineteen major issues were identified. The Ministry then produced a summary of comments on those issues for distribution to all respondents. On the basis of the submissions and meetings with various groups, MNR produced proposed responses to each of the issues.

Phase II (February, 1985 - July, 1985)

In Phase II, a series of seminars were again held to present the Ministry's proposed responses to the issues raised in Phase I. Originally, two seminars were planned, one for forest industry companies and organizations and one for Government ministries/agencies and interest groups. A third seminar was added to provide participants with an additional opportunity to attend.

Because the Canadian Environmental Law Association (CELA) and the Federation of Ontario Naturalists (FON) were unable to attend any of the seminars, a separate meeting was held for them. Lists of organizations invited to those seminars, and attendees, are presented in LIST V-6 and LIST V-7, respectively.

The purpose of these seminars was to describe the major issues which MNR identified in the review of the Phase I submissions, and to present MNR's proposed approaches to dealing with each of the issues. The seminars provided another opportunity for participants to comment, and again participants were requested to submit comments. A reminder letter was also sent to participants at the seminars to solicit comments.

Ten submissions were received from seminar participants, as well as two responses from unsolicited groups. A list of all respondents is presented in LIST V-8. Each submission was acknowledged and copies of all submissions were distributed to each respondent and to the Ministry of the Environment. Unsolicited submissions were acknowledged and distributed to others, but these respondents did not receive copies of all other submissions.

Submissions from Phase I and Phase II have been carefully considered in the preparation of this revised Class Environmental Assessment which is submitted to the Ministry of the Environment for formal review and approval under The Environmental Assessment Act.

LIST V - 1DEPUTY MINISTER'S MEETINGS - INVITATIONSMeeting No.1 (September 26, 1983) - Forest IndustryRepresentatives

Mr. K. Greaves, President
Ontario Forest Industries Association

Mr. R. C. Gimlin, Chairman
Abitibi-Price Inc.

Mr. J. Kneeland, President
Boise-Cascade Canada Ltd.

Mr. K. Buchanan, President
Buchanan Brothers (Ontario) Ltd.

Mr. J. Smith, President
Domtar Inc.

Mr. J. P. Dubreuil, President
Dubreuil Brothers Ltd.

Mr. J. C. Scarth, President
E. B. Eddy Forest Products Ltd.

Mr. C. Carter, Chairman
Great Lakes Forest Products Ltd.

Mr. W. Sanders, President
Kimberly-Clark of Canada Ltd.

Mr. G. Malette, President
Malette Lumber Inc.

Mr. J. Houghton, President
The Ontario Paper Company

Mr. F. Campling, President
Spruce Falls Power and Paper Co. Ltd.

Meeting No.2 (September 27, 1983) - Interest Group Representatives

Mr. C. Samson, Economic Development Director
Association of Iroquois and Allied Indians

Ms. G. Patterson, Director
Canadian Environmental Law Association

Mr. G. Peters, President
Chiefs of Ontario-Joint Indian Association

Professor W. A. Andrews, President
Conservation Council of Ontario

Mr. M. DeCaen, President
Federation of Northern Ontario Municipalities

Mr. J. G. Strickland, President
Federation of Ontario Cottagers' Association Inc.

Mr. R. Tilt, President
Federation of Ontario Naturalists

Mr. F. Miron, President
Lumber and Sawmill Workers Union, Local 2693

Mr. L. Winkelman, President
Northern Ontario Tourist Outfitters Association

Mr. J. Hook, President
Ontario Federation of Anglers and Hunters

Mr. J. Coats, President
Ontario Professional Foresters Association

Mr. A. Giroux, President
Ontario Trappers Association

Mr. R. Ivey, President
World Wildlife Fund

LIST V-2DEPUTY MINISTER'S MEETINGS - ATTENDEESMeeting No.1 (September 26, 1983) - Forest Industry Representatives

Mr. K. Greaves

Ontario Forest Industries Association

Mr. R. Ashby

Pulp and Paper Products Group

Mr. Koken

Abitibi-Price Inc.

Mr. K Buchanan

Buchanan Brothers (Ontario) Ltd.

Mr. C. Carter & Mr. R. Chambers

Great Lakes Forest Products Ltd.

Mr. D. H. Linton

Kimberly-Clark of Canada Ltd.

Mr. G. Cooper

The Ontario Paper Company

Mr. F. Campling

Spruce Falls Power and Paper Co. Ltd.

Meeting No.2 (September 27, 1983) - Interest Group Representatives

Ms. G. Patterson

Canadian Environmental Law Association

Mr. G. Sheehy
Canadian Nature Federation

Professor W. A. Andrews
Conservation Council of Ontario

Mr. B. Schingler
Federation of Ontario Cottagers' Association Inc.

Mr. A. Hackman
Federation of Ontario Naturalists

Mr. R. Liddle
Northern Ontario Tourist Outfitters Association

Mr. L. Males
Ontario Federation of Anglers and Hunters

Mr. J. Coats
Ontario Professional Foresters Association

Mr. E. Hawton
Ontario Trappers Association

Mr. S. Price
World Wildlife Fund

LIST V - 3PRE-SUBMISSION CONSULTATION - PHASE ISEMINARS - INVITATIONSSeminar No.1 (October 6, 1983) - Forest Industry
Companies/Organizations

Abitibi-Price Inc.
Algonquin Forestry Authority
Boise-Cascade Canada Ltd.
Buchanan Brothers (Ontario) Ltd.
Canadian Lumberman's Association
Domtar Inc.
Dubreuil Brothers Ltd.
E. B. Eddy Forest Products Ltd.
Great Lakes Forest Products Ltd.
Kimberly-Clark of Canada Ltd.
Lumber and Sawmill Workers Union, Local 2693
Malette Lumber Inc.
Ontario Forest Industries Association
Ontario Lumber Manufacturers' Association
The Ontario Paper Company
Pic River Forest Products Inc.
Spruce Falls Power and Paper Co. Ltd.
Weyerhaeuser Canada Ltd.

Seminar No. 2 (October 7, 1983) - Government Ministries/Agencies

Canadian Forestry Service, Environment Canada
Indian and Northern Affairs Canada
Ministry of Agriculture and Food, Foodland Preservation Branch
Ministry of Citizenship and Culture, Heritage Branch
Ministry of Energy, Conventional Energy Group
Ministry of the Environment, Land Use Coordination Section

Ministry of Industry and Trade, Industrial Policy and Analysis
Branch

Ministry of Municipal Affairs and Housing, Local Planning Policy
Branch

Ministry of Northern Affairs, Policy Development Branch

Ministry of Tourism and Recreation, Office of the Assistant Deputy
Minister

Ministry of Transportation and Communications, Environmental Office

Ministry of Treasury and Economics, Economic Development Branch

Association of Conservation Authorities of Ontario

Federation of Northern Ontario Municipalities

Ontario Hydro, Design and Construction Branch

Seminar No. 3 (October 20, 1983) - Interest Groups

Canadian Nature Federation

Canoe Ontario

Conservation Council of Ontario

Federation of Ontario Cottagers' Association Inc.

Ontario Archaeological Society

Ontario Federation of Anglers and Hunters

Ontario Federation of Snowmobile Clubs

Ontario Professional Foresters Association

Pollution Probe

Prospectors and Developers Association

Provincial Parks Council

Sierra Club of Ontario

Soil Conservation Society of America - Ontario Chapter

Wildlands League

Seminar No.4 (October 21, 1983) - Interest Groups

Canadian Environmental Law Association

Canadian Institute of Forestry

Canadian Wildlife Federation

Chiefs of Ontario

Energy Probe

Federation of Ontario Naturalists
Kayahna Area Tribal Council
Nature Conservancy of Canada
Northern Ontario Tourist Outfitters Association
Ontario Chamber of Commerce
Ontario Forestry Association
Ontario Heritage Foundation
Ontario Society for Environmental Management
Ontario Trappers Association
World Wildlife Fund

LIST V - 4PRE-SUBMISSION CONSULTATION - PHASE ISEMINARS - ATTENDEESSeminar No.1 (October 6, 1983) - Forest Industry
Companies/Organizations

W. A. Paul & M. R. Innes
Abitibi-Price Inc.

Mr. M. Auld
Buchanan Brothers (Ontario) Ltd.

Mr. J. A. Waddell
E. B. Eddy Forest Products Ltd.

Mr. D. H. Linton
Kimberly-Clark of Canada Ltd.

Mr. J. W. Tomlinson
The Ontario Paper Company

Mr. V. Sleep
Spruce Falls Power and Paper Co. Ltd.

Mr. A. R. Schingler
Federation of Ontario Cottagers' Association
(invited to Seminar 3)

Mrs. S. Trotter
Provincial Parks Council
(invited to Seminar 3)

Seminar No.2 (October 7, 1983) - Government Ministries/Agencies

Mr. N. Smith

Ministry of Agriculture and Food

Ms. M. Greenwald

Ministry of Citizenship and Culture

Mr. P. Shervill

Ministry of Energy

Ms. I. Wygodny

Ministry of the Environment

Ms. R. Samlalsingh

Ministry of Industry and Trade

Mr. B. Dew

Ministry of Municipal Affairs and Housing

Mr. A. Garfin

Ministry of Northern Affairs

Ms. K. Moore

Ministry of Transportation and Communications

Mr. L. Koskitalo

Ministry of Treasury and Economics

Mr. G. Thompson

Ministry of Tourism and Recreation

Mr. C.E. Bishop

Ontario Hydro

Seminar No.3 (October 20, 1983) - Interest Groups

Mr. I.K. Morrison
Canadian Forestry Service, Environment Canada
(invited to Seminar 2)

Mrs. L.W. Ives
Ontario Hydro
(invited to Seminar 2)

Mr. I.D. Bird
Algonquin Forestry Authority
(invited to Seminar 1)

Mr. J.P. Dubreuil
Dubreuil Brothers Ltd.
(invited to Seminar 1)

Mr. G. Sheehy
Canadian Nature Federation

Mr. W.A. Andrews
Conservation Council of Ontario

Mr. M. DeCaen
Federation of Northern Ontario Municipalities
(invited to Seminar 2)

Mr. A. Hackman
Federation of Ontario Naturalists
(invited to Seminar 4)

Mr. L.B. Males
Ontario Federation of Anglers and Hunters

Mr. R.J. Crandell

Ontario Federation of Snowmobile Clubs

Mr. B. Cormack

Ontario Professional Foresters Association

Mr. D. Smith & Mr. B. Griffiths

Prospectors and Developers Association

Mr. B. Fowler

Provincial Parks Council

Mr. R. Burchell

Sierra Club of Ontario

Ms. H. Cook

Wildlands League

Seminar No.4 (October 22, 1983) - Interest Groups

Mr. G. Scarffe

Indian and Northern Affairs Canada

(invited to seminar 2)

Mr. A. Herridge

Ontario Lumber Manufacturers' Association

(invited to seminar 1)

Mr. E. Tear

Weyerhaeuser Canada Ltd.

(invited to seminar 1)

Ms. G. Patterson

Canadian Environmental Law Association

Mr. D. Anderson

Chiefs of Ontario-Joint Indian Association

Mr. D. Poch
Energy Probe

Mr. D. Starkman
Kayahna Area Tribal Council

Mr. J. Phain
Nature Conservancy of Canada

Mr. R. Liddle
Northern Ontario Tourist Outfitters Association

Mr. J.D. Coats
Ontario Forestry Association

Mr. L. Cook
Ontario Trappers Association

Mr. S. Price
World Wildlife Fund

LIST V -5PRE-SUBMISSION CONSULTATION - PHASE ISUBMISSIONS RECEIVEDGovernment Ministries/Agencies

Canadian Forestry Service, Environment Canada - Mr. I.K. Morrison

Indian and Northern Affairs Canada - Mr. D.G. Scarffe

Ministry of Agriculture and Food - Mr. N. Smith

Ministry of Citizenship and Culture - Ms. M. Greenwald

Ministry of Energy - Mr. R.P. Shervill

Ministry of the Environment - Environmental Approvals and Project Engineering

Branch - Mr. B.R. Ward

Ministry of Industry and Trade - Ms. R. Samlalsingh

Ministry of Northern Affairs - Mr. A. Garfin

Ministry of Tourism and Recreation - Mr. M.J. Baker

Ministry of Transportation and Communications - Mr. J.C. Hughes

Ministry of Treasury and Economics - Mr. L. Koskitalo

Ontario Hydro - Mr. R. Murray

Forestry Industry Companies/Organizations

The Algonquin Forestry Authority - Mr. I.D. Bird

Boise-Cascade Canada Ltd. - Mr. G.J. Garner

Buchanan Forest Products Ltd. - Mr. J.M. Auld

Dubreuil Brothers Ltd. - Mr. J.P. Dubreuil

E.B. Eddy Forest Products Ltd. - Mr. J.A. Waddell

Great Lakes Forest Products Ltd. - Mr. M.R. McKay

Ontario Paper Company - Mr. J.W. Tomlinson

Spruce Falls Power and Paper Co. Ltd. - Mr. V. Sleep

Ontario Forest Industries Association - Mr. K. Greaves

Ontario Lumber Manufacturers' Association - Mr. A.J. Herridge

Interest Groups

Canadian Nature Federation - Mr. G. Sheehy
Canoe Ontario - Mr. R.H. Hickman
Chiefs of Ontario - Ms. G.A. Hill
Conservation Council of Ontario - Mr. W.A. Andrews
Energy Probe - Mr. D. Poch
Federation of Ontario Naturalists - Mr. A. Hackman
Canadian Environmental Law Association - Ms. G. Patterson
Northern Ontario Tourist Outfitters Association - Mr. R.G. Liddle
Ontario Federation of Anglers and Hunters - Mr. R.G. Morgan
Ontario Forestry Association -Mr. J.D. Coats
Ontario Professional Foresters Association -Mr. J.D. Coats
Ontario Trappers Association - Mr. A. Giroux
Prospectors and Developers Association - Mr. J.W. Griffiths
Sierra Club of Ontario - Mr. R. Burchell
Soil Conservation Society of America - Ontario Chapter - Mr. B.D.
Boyce
Wildlands League - Mr. P. Garstang

Unsolicited Submissions

Professor K.W. Hearnden, Lakehead University
Mr. T. Miyata, Atikokan
Ontario Camping Association
Toronto Field Naturalists

LIST V -6
PRE-SUBMISSION CONSULTATION - PHASE II
SEMINARS - INVITATIONS

Seminar No.1 (February 13, 1985) - Forest Industry
Companies/Organizations

Abitibi-Price Inc.
Algoma Central Railway
Algonquin Forestry Authority
Boise-Cascade Canada Ltd.
Buchanan Forest Products Ltd.
Consolidated-Bathurst Inc.
Domtar Forest Products
Dubreuil Brothers Limited
E.B. Eddy Forest Products Ltd.
Elk Lake Planing Mill Ltd.
Great Lakes Forest Products Ltd.
Great West Timber Ltd.
James River - Marathon Ltd.
Kimberly-Clark of Canada Ltd.
The M.J. Poupore Lumber Company Ltd.
Malette Lumber Inc.
Martin Lumber Ltd.
Midway Lumber Mills Ltd.
Milne and Sons Ltd.
Normick Inc.
Ontario Lumber Manufacturers' Association
Ontario Paper Company
Pic River Forest Products Inc.
Spruce Falls Power and Paper Co. Ltd.
Weyerhaeuser Canada Ltd.

Seminar No.2 (February 22, 1985) - Government Ministries/Agencies
and Interest Groups

Canadian Forestry Service, Environment Canada
 Ministry of Citizenship and Culture, Heritage Branch
 Ministry of the Environment, Environmental Approvals and Project
 Engineering
 Ministry of Northern Affairs, Policy Development Branch
 Ministry of Tourism and Recreation, Deputy Minister's Office
 The Algonquin Forestry Authority
 Canadian Environmental Law Association
 Canadian Nature Federation
 Canoe Ontario
 Chiefs of Ontario
 The Conservation Council of Ontario
 Energy Probe
 Federation of Ontario Naturalists
 Northern Ontario Tourist Outfitters Association
 Ontario Federation of Anglers and Hunters
 Ontario Forestry Association
 Ontario Lumber Manufacturers' Association
 Ontario Professional Foresters Association
 Ontario Trappers Association
 Prospectors and Developers Association
 Sierra Club of Ontario
 Soil Conservation Society of America - Ontario Chapter
 Wildlands League

Seminar No.3 (April 3, 1985) - Alternative Seminar for those unable
to attend Seminar Nos. 1 or 2

Buchanan Forest Products Ltd.
 Canadian Environmental Law Association
 Canadian Nature Federation
 Canoe Ontario
 The Conservation Council of Ontario
 Dubreuil Brothers Ltd.

Energy Probe
Federation of Ontario Naturalists
Great West Timber Ltd.
James River - Marathon Ltd.
Kimberly-Clark of Canada Ltd.
The M.J. Poupore Lumber Company Ltd.
Malette Lumber Inc.
Midway Lumber Mills Ltd.
Ministry of Citizenship and Culture, Heritage Branch
Milne and Sons Ltd.
Normick Inc.
Ontario Federation of Anglers and Hunters
Ontario Trappers Association
Pic River Forest Products Inc.
Prospectors and Developers Association
Soil Conservation Society of America - Ontario Chapter
Spruce Falls Power and Paper Co. Ltd.
Weyerhaeuser Canada Ltd.

Seminar No.4 (May 7, 1985) - Representatives of CELA and FON

Canadian Environmental Law Association (CELA)
Federation of Ontario Naturalists (FON)

LIST V -7PRE-SUBMISSION CONSULTATION - PHASE IISEMINARS - ATTENDEESSeminar No.1 (February 13, 1985) - Forest Industry
Companies/Organizations

Mr. M. R. Innes & Mr. B. Pauli
Abitibi-Price Inc.

Mr. G. Raines
Algoma Central Railway

Mr. G. J. Garner & Mr. L. Louder
Boise-Cascade Canada Ltd.

Mr. D. A. Ackenhurst & Mr. R. R. Pickering
Consolidated-Bathurst Inc.

Mr. B. E. Jarvis
Domtar Forest Products

Mr. J. A. Waddell, Mr. J. Atherton & Mr. M. Opper
E. B. Eddy Forest Products Ltd.

Mr. R. Magee
Elk Lake Planing Mill Ltd.

Mr. W. S. Moore & Mr. B. Bunney
Great Lakes Forest Products Ltd.

Mr. B. Charlesworth
Martin Lumber Ltd.

Seminar No.2 (February 22, 1985) - Government Ministries/Agencies
and Interest Groups

Mr. I. K. Morrison, Mr. G. Huntley & Mr. A. Ballak
Canadian Forestry Service, Environment Canada

Mrs. I. Wygodny
Ministry of the Environment

Mr. A. J. Garfin
Ministry of Northern Affairs

Mr. G. Thompson
Ministry of Tourism and Recreation

Mr. I. D. Bird & Mr. B. Connelly
Algonquin Forestry Authority

Mr. R. B. Loughlan
Ontario Forest Industries Association

Mr. A. Herridge
Ontario Lumber Manufacturers' Association

Mr. W. J. Charlesworth
Martin Lumber Ltd.

Mr. D. P. Achnaipneskun
Chiefs of Ontario

Mr. L. Lindner
Northern Ontario Tourist Outfitters Association

Mr. F. Burrows
Ontario Forestry Association

Mr. J. Coats
Ontario Forestry Association &
Ontario Professional Foresters Association

Mr. R. Burchell
Sierra Club of Ontario

Ms. H. Cook
Wildlands League

Seminar No.3 (April 3, 1985)

Ms. M. Greenwald & Mr. P. Carruthers
Ministry of Citizenship and Culture

Mr. G. Sheehy
Canadian Nature Federation

Mr. W. A. Andrews
Conservation Council of Ontario

Mr. J. Phillips
Normick-Perron Inc.

Mr. L. Males
Ontario Federation of Anglers and Hunters

Mr. M. Williams
Ontario Forestry Association &
Conservation Council of Ontario

Seminar No.4 - (May 7, 1985)

Ms. G. Patterson
Canadian Environmental Law Association

Mr. M. Singleton

Federation of Ontario Naturalists

LIST V - 8PRE-SUBMISSION CONSULTATION - PHASE IISUBMISSIONS RECEIVEDGovernment Ministries/Agencies

Ministry of Citizenship and Culture - Ms. M. Greenwald

Ministry of the Environment - Environmental Approvals and
Project Engineering Branch - Mr. P. Joseph

Ministry of Northern Affairs - Mr. A. J. Garfin

Forestry Industry Companies/Organizations

Ontario Forest Industries Association - Mr. I. D. Bird

Ontario Lumber Manufacturers' Association - Mr. A. J. Herridge

Interest Groups

Canadian Nature Federation - Mr. G. Sheehy

Chiefs of Ontario - Ms. G. A. Hill

Northern Ontario Tourist Outfitters Association - Mr. D. Rogerson

Ontario Forestry Association - Mr. J. A. Coats

Wildlands League - Mr. P. Garstang

Unsolicited Submissions

Nishnawbe-Aski Nation - Mr. D. Cromarty

Union of Ontario Indians - Ms. K. G. Mason

APPENDIX VI

APPENDIX VI

TIMBER LICENCES

MNR conveys the right to harvest timber on Crown lands through a variety of "timber licences". The current licensing system was introduced in 1953 with a revision to The Crown Timber Act. The system has essentially remained unchanged except for the introduction of Forest Management Agreements (FMAs) in 1979.

Regardless of the form of tenure or authority granted to companies, there are certain general provisions which are consistent in all forms of licences. Licences are normally limited to specified areas and tree species. However, no licence conveys any rights to Crown land, and the right to cut timber specified in a licence is subject to an annual approval to commence cutting operations. For all licensed areas, the Ministry of Natural Resources retains ultimate responsibility for management planning, regeneration and protection, although licence holders may carry out some of the specific duties associated with those activities.

There are several types of licences which the Ministry employs in the disposition of Crown timber.

Order-In-Council Licences are granted by the Minister of Natural Resources under the authority of subsection 3 (1) of The Crown Timber Act, subject to the approval of the Lieutenant-Governor-in-Council. There is no legislative limit prescribed for the size and period of these licences, but they are generally limited to periods of twenty-one years for larger licence areas (up to approximately 6,000 square kilometres) and five years for smaller licensed areas ranging approximately from 1 to 2,000 square kilometres. There are up to 400 of these licences in effect in any one year.

Order-In-Council Licences have been the principal vehicle for

authorizing the disposition of timber between 1920 and the early-1980s. In 1980, more than 90% of the area devoted to timber production in Ontario was licensed under such authorization. This proportion has been decreasing, however, since the introduction of Forest Management Agreements (FMAs) in 1979.

Forest Management Agreements (FMAs) provide for a sharing of timber management responsibilities between the Ministry and a company, and also convey harvesting rights along with other general provisions. The Minister of Natural Resources may enter into such agreements subject to the approval of the Lieutenant-Governor-in-Council.

A growing proportion of the timber resource base is being administered under Forest Management Agreements. By June of 1985, there were a total of 26 Agreements which account for approximately 56% of the total Crown land area under licence. It is expected that Forest Management Agreements will be the principal form of authorization for the disposition of timber in the future, eventually covering approximately 75% of the total licensed area.

Licences For Tendered Sales of Timber were a form of timber disposition which was commonly used in the early part of this century. This form of licensing has been replaced by Order-In-Council Licences and Forest Management Agreements, and now applies to less than 200 square kilometres (i.e. less than 1% of the total licensed area) each year.

These licences involve the sale of timber by tender, either to the public generally or to a particular group of persons who in the opinion of the Minister are interested in such timber as a source of supply for mills in existence at the time of the offer. These licences can be issued with delegated authority by the Regional Director or by the Director, Timber Sales Branch, depending on the size of the licence area and the period of the licence.

District Cutting Licences generally are for the purpose of providing local residents with rights to Crown timber for personal

use, such as fuelwood, or for small scale commercial operations.
 District Cutting Licences are granted under subsection 2(7) of The Crown Timber Act with delegated authority by the District Manager, and are limited to an area of 65 hectares.

The area devoted to District Cutting Licences represents a small portion of the productive land base. The number of such licences is large, however, approaching 10,000 per year, approximately 7,000 of which are for fuelwood purposes.

Salvage Licences were introduced in the late 1940s in order to provide a vehicle for the expedient recovery of killed or damaged timber (i.e. timber affected by fire or insect/disease infestations). The District Manager has been granted the authority to set prices, terms and conditions, and to issue the licence, so that damaged timber can be recovered before it is wasted.

Salvage licences are not limited in size or terms, but are commonly issued for small areas for periods of one or two years. Approximately 40 licences are issued per year, involving a total area of 100 to 500 kilometres.

Third Party Licences may be issued to encourage full utilization of timber on areas which are currently under licence. This procedure allows the prime licensee to assign part of its licence, and may be carried out where a species of timber or volume is excess to that licensee's requirements. The prime licensee and the third party are required to enter into a mutually acceptable agreement which assigns responsibility to the third party.

The Minister's written consent is required for all third party licences; the consent has been delegated to the Director, Timber Sales Branch. A licence is then issued to transfer the legal responsibility to the third party. These licences are usually in the form of Order-in-Council Licences, but may also involve District Cutting Licences for small areas.

Timber Supply Agreements are a form of agreement which the Ministry also employs in the administration of the Crown timber resource. These agreements may be entered into with companies or individuals under Section 4 of The Crown Timber Act for a supply of Crown timber from Crown Management Units. The agreements do not convey any rights to harvest timber; however, the agreement commits the Minister to offering licences if the agreement holder meets other conditions.

Under such agreements, Order-in-Council Licences are issued to either the agreement holder or to an individual who is satisfactory to the Minister and has a contract with the agreement holder.

Appendix VII

APPENDIX VII
AN AUDIT OF MANAGEMENT
OF THE CROWN FORESTS OF ONTARIO

SUMMARY OF MNR'S ACTION PLAN (OCTOBER, 1986)

1. The Ontario Wood Supply Model, which the ministry uses to determine harvest levels, will be modified to provide improved local projections and will be at the disposal of all field foresters by December, 1987.
2. Information on timber volumes for areas of the existing natural forest, specific to the management unit level, will be available by December, 1987.
3. A current survey of the new, regenerated forest to determine areas, species and growth will be expanded to cover the whole province. The target date for completion is December, 1988.
4. A group of ministry and forest industry officials under the chairmanship of Dr. James Kayll, Director of Forestry at Lakehead University, Thunder Bay, will establish more detailed criteria for forest stand allocation to ensure the best timber utilization. That report will be received by July 1, 1987.
5. The ministry has just completed a major study on mill demand and timber supply across northern Ontario, including Algonquin region. Information from this wood flow study will be used in conjunction with Dr. Kayll's report.
6. A series of workshops are under way to train field foresters to use economic criteria in decisions on lands to be regenerated.

7. Beginning in 1987, all new Timber Management Plans will contain clear statements of objectives that are measurable and attainable. 1
2
3
4
8. A new Forest Production Policy, taking into account those new objectives, the supply capability of Ontario's forests and the demands of industry, will be developed and completed by October, 1988. 5
6
7
8
9
9. A comprehensive study of the economic condition of Ontario's forest industry will be undertaken by a consultant and completed by September, 1987. 10
11
12
13
10. The ministry will conduct an examination into the effects of timber management practices on non-timber values such as wildlife habitat and tourism. 14
15
16
17
11. Senior ministry management is taking steps to communicate to all forestry staff that systematic management planning should not be allowed to impede innovation, and that the role of the unit forester is crucial to the success of the forest management program. 18
19
20
21
22
23
12. New criteria for levels of responsibility, accountability and progressive career development for ministry foresters will be developed within the next 12 months. Unit foresters will be accountable for the forest management unit. 24
25
26
27
28
13. A notable panel of academics in the forestry field will advise the ministry on appropriate training for upgrading practising forestry professionals. 29
30
31
32
14. To ensure that accountability for forest management units is well-defined within the ministry, all Forest Management Agreements (FMAs) and Crown Management Units (CMUs) will be the responsibility of full-time unit foresters by the 33
34
35
36

beginning of 1988.

1

2

15. To provide leadership in professional and scientific forestry practices within the ministry, the new position of Provincial Forester has been created.

3

4

5

6

16. A group headed by Dr. Robert Rosehart, President of Lakehead University, will evaluate the ministry's Forest Resources Inventory (FRI), and recommend a process for verifying it on an ongoing basis. The group will include academics, environmentalists and forest industry representatives.

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25

26

27

28

29

30

31

32

33

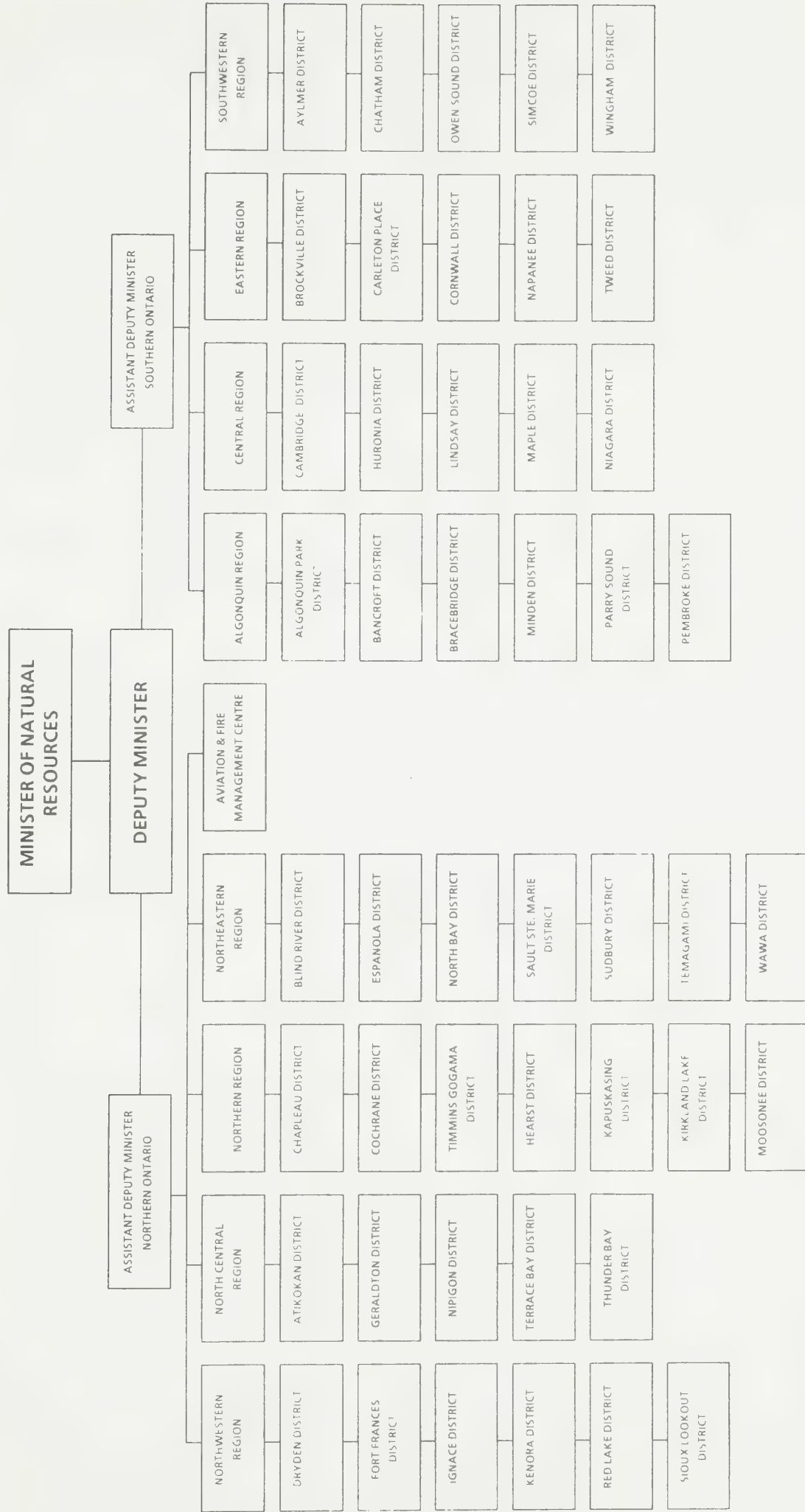
34

35

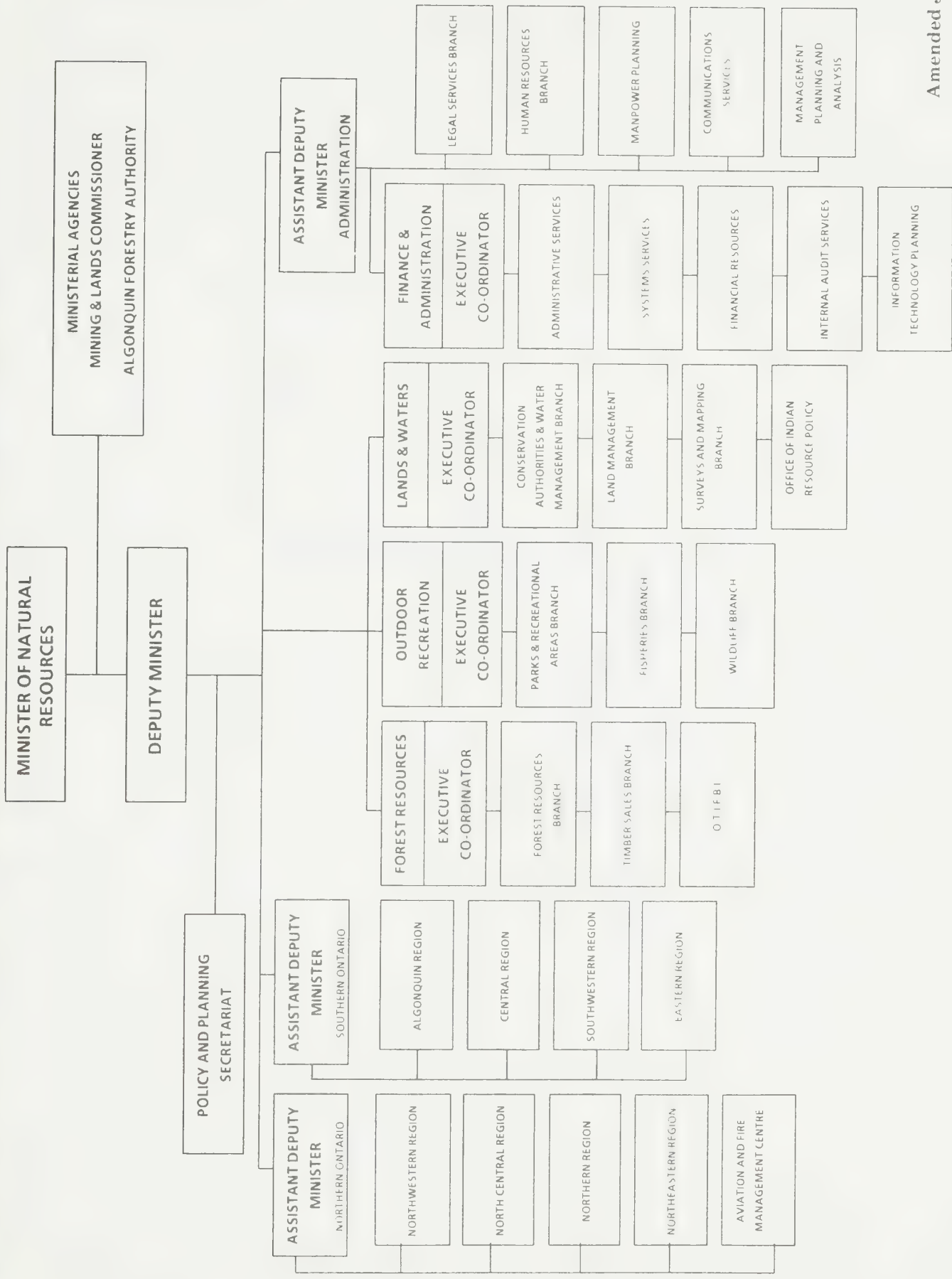
36

Appendix VIII

THE MINISTRY OF NATURAL RESOURCES – FIELD ORGANIZATION CHART



THE MINISTRY OF NATURAL RESOURCES – ORGANIZATION CHART



Appendix IX

1
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36

APPENDIX IX
FOREST MANAGEMENT UNITS IN
AREA OF THE UNDERTAKING (JUNE 1, 1987)

NORTHWESTERN REGION

<u>DISTRICT</u>	<u>MANAGEMENT UNIT</u>	<u>NUMBER</u>	<u>TYPE</u>
DRYDEN	WABIGOON	130	COMPANY
	EAST PATRICIA FOREST	331	FMA
	DRYDEN	535	CROWN
FORT	MANITOU FOREST	320	FMA
FRANCES	SEINE RIVER FOREST	340	FMA
	RAINY LAKE	831	CROWN
	RAINY RIVER	835	CROWN
IGNACE	ENGLISH RIVER FOREST	174	FMA
KENORA	LAKE OF THE WOODS FOREST	310	FMA
	AULNEAU	457	CROWN
	MINAKI	731	CROWN
RED LAKE	TROUT LAKE FOREST	120	FMA
	PAKWASH FOREST	333	FMA
	RED LAKE	840	CROWN
SIoux	ABITIBI SIoux LOOKOUT	50	COMPANY
LOOKOUT	CARIBOU WEST	171	COMPANY
	CARIBOU EAST	172	COMPANY
	LAC SEUL FOREST	869	COMPANY
	SIoux LOOKOUT	875	CROWN
	REBA	878	COMPANY

NORTH CENTRAL REGIONDISTRICTMANAGEMENT UNITNUMBERTYPE

ATIKOKAN

FLANDERS

821

CROWN

SAPAWA

853

CROWN

GERALDTON

OGOKI

241

COMPANY

NAKINA FOREST

242

FMA

GERALDTON

243

COMPANY

LONGLAC FOREST

244

FMA

NIPIGON

AUDEN

20

COMPANY

LAKE NIPIGON FOREST

445

FMA

DOMTAR-ARMSTRONG

447

COMPANY

NIPIGON

625

CROWN

KIASHKE

651

COMPANY

THUNDER BAY

SPRUCE RIVER FOREST

30

FMA

BRIGHTSANDS FOREST

173

FMA

DOG RIVER-MATAWIN FOREST

177

FMA

BLACK STURGEON FOREST

178

FMA

FORT WILLIAM

560

CROWN

PORT ARTHUR

803

CROWN

SHEBANDOWAN

865

CROWN

TERRACE BAY

BIG PIC

67

COMPANY

BLACK RIVER FOREST

370

FMA

STEEL RIVER

380

CROWN

NORTHERN REGION

<u>DISTRICT</u>	<u>MANAGEMENT UNIT</u>	<u>NUMBER</u>	<u>TYPE</u>	
				1
				2
				3
				4
				5
				6
COCHRANE	IROQUOIS FALLS FOREST	11	FMA	7
	SMOOTH ROCK FALLS	40	COMPANY	8
	GARDINER FOREST	401	FMA	9
	COCHRANE	520	CROWN	10
	COCHRANE FOREST	521	FMA	11
	MOOSE RIVER	738	CROWN	12
				13
CHAPLEAU	PINELAND FOREST	420	FMA	14
	MARTEL	515	COMPANY	15
	SUPERIOR FOREST	508	FMA	16
				17
GOGAMA	UPPER SPANISH FOREST	160	FMA	18
	SHININGTREE	868	CROWN	19
				20
HEARST	NAGAGAMI FOREST	390	FMA	21
	HEARST FOREST	601	FMA	22
				23
KAPUSKASING	GORDON COSENS FOREST	439	FMA	24
	KAPUSKASING	630	CROWN	25
				26
KIRKLAND LAKE	IROQUOIS FALLS SOUTH	10	COMPANY	27
	ELK LAKE	545	CROWN	28
	W.L. PLONSKI	550	CROWN	29
	TIMISKAMING	901	CROWN	30
	WATABEAG	940	CROWN	31
				32
TIMMINS	TIMMINS FOREST	400	FMA	33
	TIMMINS	900	CROWN	34
	R. MALETTE FOREST	930	FMA	35
				36

NORTHEASTERN REGION

<u>DISTRICT</u>	<u>MANAGEMENT UNIT</u>	<u>NUMBER</u>	<u>TYPE</u>	
				1
				2
				3
				4
				5
				6
BLIND RIVER	BLIND RIVER	480	CROWN	7
	KIRKWOOD	665	CROWN	8
	PESHU LAKE	801	CROWN	9
				10
ESPANOLA	LOWER SPANISH FOREST	161	FMA	11
	MANITOULIN	700	CROWN	12
	SPANISH RIVER	881	CROWN	13
				14
NORTH BAY	MATTAWAN	721	CROWN	15
	TOMIKO	902	CROWN	16
	VERNER	919	CROWN	17
	WASI	938	CROWN	18
				19
SAULT STE. MARIE	GOUGLAIS-BATCHAWANA	590	CROWN	20
	RANGER LAKE	837	CROWN	21
	SAULT STE. MARIE	860	CROWN	22
				23
SUDBURY	KILLARNEY	653	CROWN	24
	TROUT LAKE	908	CROWN	25
	WANAPITEI	936	CROWN	26
				27
TEMAGAMI	LATCHFORD	691	CROWN	28
	TEMAGAMI	896	CROWN	29
				30
WAWA	WHITE RIVER FOREST	60	FMA	31
	JACK PINE RIVER	61	CROWN	32
	MAGPIE FOREST	565	FMA	33
	LAKE SUPERIOR PROVINCIAL PARK	846	CROWN	34
	TIKAMAGANDA	855	CROWN	35
	WAWA	945	CROWN	36

ALGONQUIN REGION

<u>DISTRICT</u>	<u>MANAGEMENT UNIT</u>	<u>NUMBER</u>	<u>TYPE</u>
ALGONQUIN	ALGONQUIN PARK	451	COMPANY
BANCROFT	BANCROFT	464	CROWN
BRACEBRIDGE	BRACEBRIDGE	483	CROWN
MINDEN	FROST CENTRE	566	CROWN
	MINDEN	715	CROWN
PEMBROKE	BONNECHERE	476	CROWN
	MADAWASKA	710	CROWN
PARRY SOUND	GEORGIAN BAY	576	CROWN
	PARRY SOUND	799	CROWN

EASTERN REGION

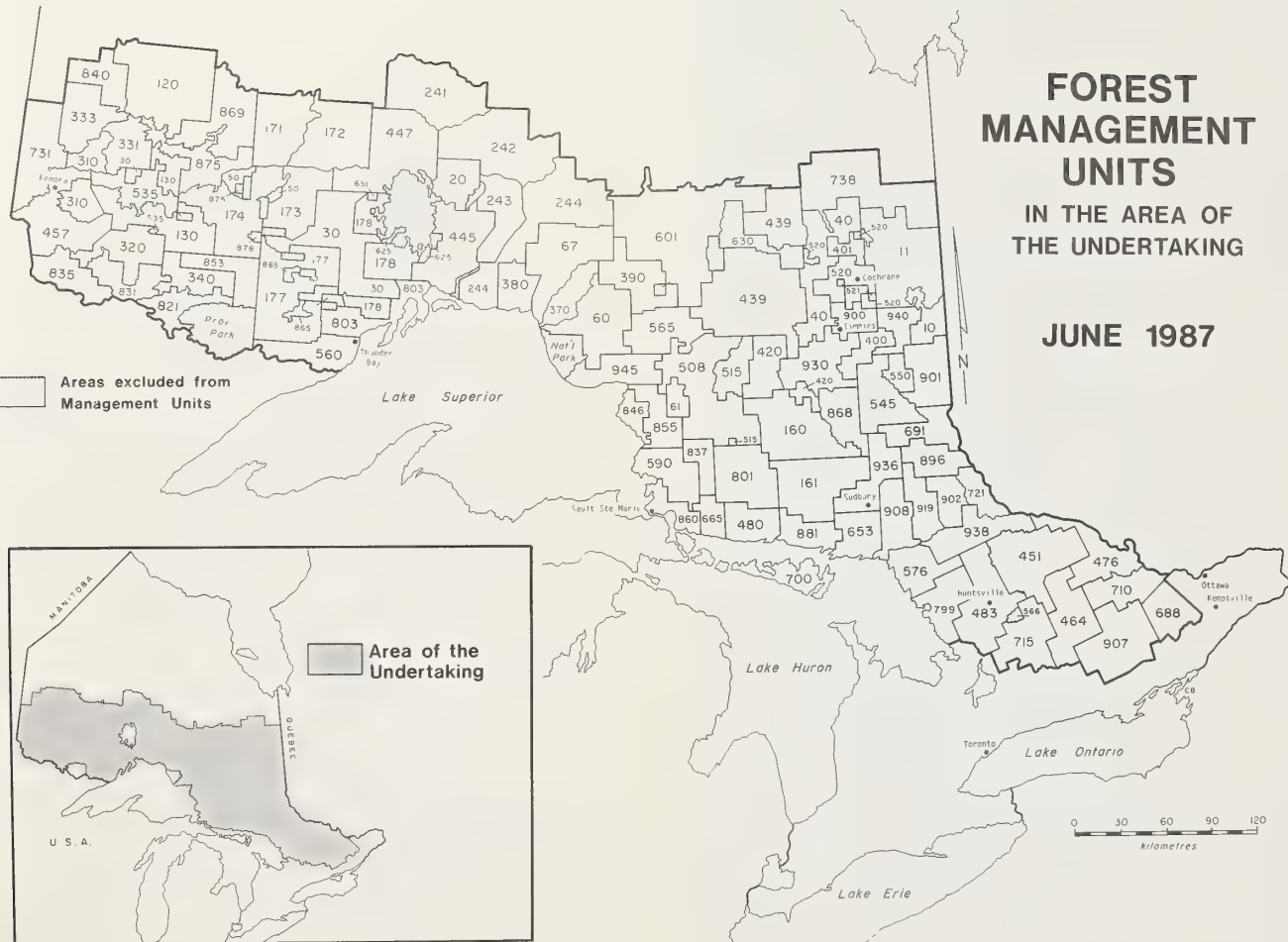
<u>DISTRICT</u>	<u>MANAGEMENT UNIT</u>	<u>NUMBER</u>	<u>TYPE</u>
CARLETON PLACE	LANARK	688	CROWN
TWEED	TWEED	907	CROWN

FOREST MANAGEMENT UNITS

IN THE AREA OF
THE UNDERTAKING

JUNE 1987

Areas excluded from
Management Units



Appendix X

1
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36

APPENDIX X

MNR AUTHORIZING DOCUMENTS REQUIRED PRIOR TO
COMMENCEMENT OF OPERATIONS

This appendix provides a listing of MNR's authorizing documents which are required by an individual or forest company prior to the commencement of timber management operations. Formal applications for most of these documents are required.

Many of these documents are initiated during the District review of the Annual Work Schedule (e.g. Work Permit). Some documents are not authorized until the Annual Work Schedule has been approved (e.g. District Cutting Licence). Prior authorization is also necessary for activities which may be required during the course of the operating year (e.g. Quarry Permit for the development of a new gravel pit).

In addition, authority from other government ministries/agencies may also be required prior to proceeding with specific operations. For example, an "Application to Perform an Extermination from an Airborne Machine" (MOE Form 5) must be submitted to the Ministry of the Environment for approval under The Ontario Pesticides Act prior to proceeding with any project which involves the aerial application of pesticides for timber management purposes.

The authority of one or more of the following MNR authorizing documents may be required prior to the commencement of operations:

- Work Permit (Forest Fires Prevention Act, R.S.O. 1980 c.173, s.15 (1))
- Quarry Permit (Mining Act, R.S.O. 1980, c.268, s.118 (1))

• Land Use Permit (<u>Public Lands Act</u> , R.S.O. 1980, Reg. 867, s.1)	1
	2
• Approval to Commence Cutting Operations (<u>Crown Timber Act</u> , R.S.O. 1980, c.109, s.14(1))	3
	4
	5
• Pit or Quarry Licence (<u>Pits and Quarries Control Act</u> , R.S.O. 1980, c.378, s.4(1))	6
	7
	8
• Licence to Cut Crown Timber (<u>Crown Timber Act</u> , R.S.O. 1980):	9
	10
- Order-In-Council (<u>Crown Timber Act</u> , R.S.O. 1980, c.109, s.3 (1))	11
	12
	13
- District Cutting Licence (<u>Crown Timber Act</u> , R.S.O. 1980, c.109, s.2 (7))	14
	15
	16
- Salvage Licence (<u>Crown Timber Act</u> , R.S.O. 1980, c.109, s.5(1))	17
	18
	19
- Tender Sale Licence (<u>Crown Timber Act</u> , R.S.O. 1980, c.109, s.2(2))	20
	21
	22
• Approval under the <u>Lakes and Rivers Improvement Act</u> , R.S.O. 1980, c.229, s.2(c).	23
	24
	25
	26
	27
	28
	29
	30
	31
	32
	33

Appendix XI

APPENDIX XI

PROCEDURE FOR AMENDMENTS TO TIMBER MANAGEMENT PLANS

As discussed in PART TWO, Chapter 2, Section 2.1.5.2, amendments to an approved Timber Management Plan may be required during its five-year term. Three categories of amendments are provided:

administrative, minor and major. The following discussion outlines the planning, review and approval requirements which apply to each category of amendment.

Administrative Amendments

If the District Manager determines that the request for an amendment should proceed, and that the amendment should be processed as an administrative amendment, the proposed amendment will automatically be approved at the time of the request. The District Manager will notify the amendment requestor of the approval of the amendment, and the approved amendment will be appended to the previously-approved Timber Management Plan at the MNR District office.

Once a year, coincident with the approval of the Annual Work Schedule (which normally is required by the first day of April of each year), the District Manager will provide copies of each approved administrative amendment to the Timber Management Plan during the previous year to the Environmental Assessment Branch, Ministry of the Environment for their public record files.

Examples of the types of situations in which administrative amendment provisions will normally apply include:

- requests to permit operations within a "contingency area";
- decisions from among previously-approved alternative prescriptions in areas of concern.

Minor Amendments

If the District Manager determines that the request for an amendment should proceed, and that the amendment should be processed as a minor amendment, the MNR management unit forester or forest company will be directed to complete all necessary planning requirements and submit the proposed minor amendment for MNR review and approval.

The planning requirements will depend on the nature of the operations proposed in the amendment, but will involve the same technical planning requirements as would be required if the operations were proposed in the preparation of a new Timber Management Plan. In particular, the comprehensive planning requirements for access roads and operations in areas of concern, as described in APPENDICES I and II, will apply, where applicable. The appropriate supplementary documentation is also required.

Upon submission of the proposed minor amendment, the MNR District office will undertake an immediate internal review. If the review is favourable, the District Manager will issue a public notice, prior to a final decision on the approval of the proposed minor amendment, inviting interested external participants to review, and comment on, the proposed minor amendment.

The public notice will normally be in the form of:

- direct written notice to all previously-identified participants in the preparation of the approved Timber Management Plan, and all parties/persons known to be directly affected by the timber management operations proposed in the minor amendment; and
- general public notices, usually in the form of paid public advertisements in the local media, advising the general public of the opportunity to review the proposed minor amendment.

Direct verbal communication may serve as an additional form of notification, where appropriate.

The public notice will include:

- a description of the proposed minor amendment, including a suitably-descriptive map;
- a statement that the proposed minor amendment will be approved on or after a specified date unless objections are received; and
- a statement which indicates that further public consultation may be required if objections are received.

A minimum period of fifteen (15) days after the date of the public notice is provided for interested participants to present comments and submissions to the District Manager regarding the proposed minor amendment.

If no objections to the proposed minor amendment are received during that period, or if objections which have been received can be resolved with no substantial change to the proposed amendment, the amendment will be approved by the District Manager. If the District Manager considers objections which have been received to be unreasonable, or determines that there is legitimate urgency which requires the proposed amendment to proceed, notwithstanding an objection which cannot be resolved, the amendment will be approved by the District Manager, but only after obtaining the concurrence of the Regional Director. In such situations, the District Manager will give notice with reasons to the party/person expressing the objection that the objection cannot be accommodated.

Whenever a proposed minor amendment is approved, the District Manager will notify the amendment requestor of the approval of the minor amendment, and the approved amendment will be appended to the previously-approved Timber Management Plan at the MNR District and Regional Offices. Upon approval of a minor amendment, the District

Manager will provide a copy of the approved minor amendment to the Environmental Assessment Branch, Ministry of the Environment for their public record files.

During public review, objections may be received which are unresolvable, or resolvable only with a substantial change to the proposed minor amendment. Unless the request for an amendment is withdrawn entirely, further planning and public consultation will be required, either as a new revised minor amendment proposal or as a major amendment proposal.

Examples of the types of situations in which minor amendment provisions will normally apply include:

- resolution of deferred decisions on operational prescriptions for areas of concern in an approved Timber Management Plan;
- urgently-required harvest operations in areas of recent natural disturbance (e.g. forest fires) which were not previously selected for harvest; and
- determination of operational prescriptions for any new areas of concern which are identified within the approved area of operations during the five-year term of the Timber Management Plan.

Major Amendments

If the District Manager determines that the request for an amendment should proceed, and that the amendment should be processed as a major amendment, the MNR management unit forester or forest company will be directed to complete all necessary planning and public consultation requirements and submit the proposed major amendment for MNR review and approval.

The planning requirements will depend on the nature of the operations proposed in the amendment, but will involve the same

level of planning as would be required if the operations were proposed in the preparation of a new Timber Management Plan. In particular, the comprehensive planning requirements for access roads and operations in areas of concern, as described in APPENDICES I and II, will apply, where applicable.

The minimum requirements for public consultation in the preparation of a major amendment include:

- (i) an INFORMATION CENTRE to provide an opportunity for interested external participants to review, and comment on, the major amendment proposal, and the analysis of alternatives, before a decision is made; and
- (ii) an opportunity for public INSPECTION of the MNR-approved major amendment.

PUBLIC REVIEW - INFORMATION CENTRE - Prior to the submission of the proposed major amendment for MNR review and approval, the District Manager will issue a public notice inviting interested external participants to an INFORMATION CENTRE to review, and comment on, the preliminary major amendment proposal and the analysis of alternatives. This public notice must be issued at least twenty-one (21) days in advance of the date of the INFORMATION CENTRE.

The public notice will normally be in the form of:

- direct written notice to all previously-identified participants in the preparation of the approved Timber Management Plan, and all parties/persons known to be directly affected by the timber management operations proposed in the major amendment proposal; and
- general public notices, usually in the form of paid public advertisements in the local media, advising the general public of the opportunity to review the major amendment proposal at the INFORMATION CENTRE.

Direct verbal communication may serve as an additional form of notification, where appropriate.

The public notice will include:

- a description of the proposed major amendment, including a suitably-descriptive map;
- where appropriate, either a description of the alternatives which were considered (e.g. access road locations), or a discussion that the consideration of alternatives was a requirement of the planning process for the major amendment proposal.

At the INFORMATION CENTRE, members of the MNR planning team will be present to explain the major amendment proposal and respond to any inquiries. For company-prepared amendments, the major amendment proposal will be explained primarily by company staff, with MNR staff available in a support role.

Although a broad array of information will be provided at the INFORMATION CENTRE in the form of maps, displays and written material, the following information must be available, and is expected to be the principal focus of attention:

- maps which identify the specific areas of concern to other MNR program groups and other Crown land resource users;
- where appropriate, maps which identify alternatives, and preliminary proposals, for the locations of the primary and/or secondary access roads which are the subject of the major amendment proposal;
- the analysis of those alternative access road locations; and
- where appropriate, the analysis of, and proposals for, operations within specific areas of concern.

The minimum requirement for the INFORMATION CENTRE is a one-day opportunity at a convenient location. A period of thirty (30) days

after the date of the INFORMATION CENTRE is provided for interested participants to present submissions regarding concerns with the proposed major amendment.

It is recognized that all interested participants may not be able to attend the INFORMATION CENTRE. Therefore, the major amendment proposal will be available for public review at the MNR District office for a period of thirty (30) days after the date of the INFORMATION CENTRE. Members of the MNR planning team will be available to explain the major amendment proposal and respond to any inquiries.

It is also recognized that additional areas of concern may be identified by interested participants during this stage of public consultation. If necessary, additional opportunities will be provided for those participants to review and comment on alternatives, and proposals, for access road locations and/or operations within those areas of concern, prior to finalization of the major amendment proposal.

FINALIZATION AND MNR REVIEW OF THE PROPOSED MAJOR AMENDMENT - After the thirty (30)-day review period, the major amendment proposal will be finalized and submitted for MNR review and approval. Upon submission, the major amendment proposal must be accompanied by supplementary documentation which describes:

- the submissions which were received during public consultation, and how they have been considered in the preparation of the major amendment proposal;
- where appropriate, the application of the comprehensive planning requirements for:
 - (i) access roads, and/or
 - (ii) operations in specific areas of concern.

Upon submission of the proposed major amendment and accompanying

supplementary documentation, MNR will undertake an immediate internal review by the District, Region, and Forest Resources Group, Main Office. If the review is favourable, the amendment will be approved jointly by the Director, Timber Sales Branch and the Regional Director, normally within fifteen (15) days of the submission of the major amendment proposal. The Director, Timber Sales Branch will notify the District Manager, and for company-prepared major amendments, the particular forest company involved, of the MNR approval of the major amendment proposal, subject to a 30-day public inspection period which provides a final opportunity for interested participants to request a "Bump-up" of the proposed major amendment to individual environmental assessment status (Refer to PART TWO, Section 2.3).

NOTIFICATION TO MINISTRY OF THE ENVIRONMENT - Upon approval of the proposed major amendment by MNR senior management, the Director, Timber Sales Branch will notify the Environmental Assessment Branch, Ministry of the Environment, and will submit a copy of the MNR-approved major amendment for their public record files.

PUBLIC INSPECTION OF THE APPROVED MAJOR AMENDMENT - At the same time as the Ministry of the Environment is notified, the District Manager will issue a public notice advising interested external participants that the MNR-approved major amendment is available for inspection.

The public notice will normally be in the form of:

- direct written notices to all previously identified participants, and all parties/persons known to be directly affected by timber management operations proposed in the major amendment; and
- general public notices, usually in the form of paid public advertisements in the local media, advising the general public of the opportunity for inspection of the MNR-approved major amendment.

Direct verbal communication may serve as an additional form of notification, where appropriate.

The public notice will clearly indicate that the opportunity for inspection of the MNR-approved major amendment provides a final opportunity for interested participants to request a "Bump-up" of the major amendment to individual environmental assessment status (Refer to PART TWO, Section 2.3). A thirty (30)-day period after the date of the public notice is provided for interested participants to pursue such a request. If a request is not received during that period, the MNR-approved major amendment automatically receives final approval. The final approved major amendment will be appended to the previously-approved Timber Management Plan at the MNR District, Regional and Main Offices.

Examples of the types of situations in which major amendment provisions will normally apply include:

- any new primary or secondary access road proposals;
- the planning of operations in large areas which were not previously selected for harvest, renewal or tending operations in an approved Timber Management Plan; and
- the planning of operations in areas of surplus, if not previously undertaken during the preparation of the Timber Management Plan.

(NOTE: For any amendment, whether administrative, minor or major, if operations are intended to be implemented during the term of the current approved Annual Work Schedule (Refer to PART TWO, Section 2.2), those operations must be described. In such situations, a copy of the approved amendment to the Timber Management Plan must, therefore, also be appended to the approved Annual Work Schedule.)



3 1761 11548393 5